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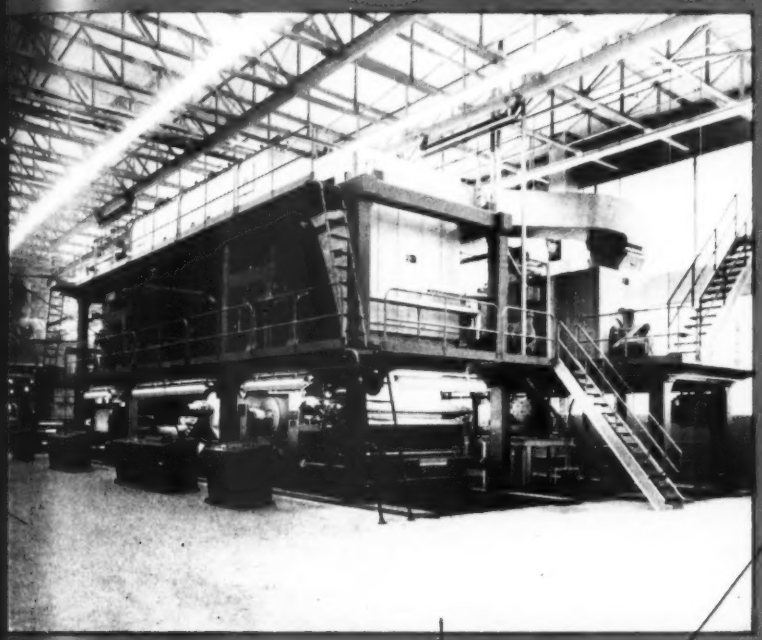

- New Flexiblade Coater at Newton Falls
- The Bauerite process
- Where to use radioactive isotopes
- The market oriented engineer

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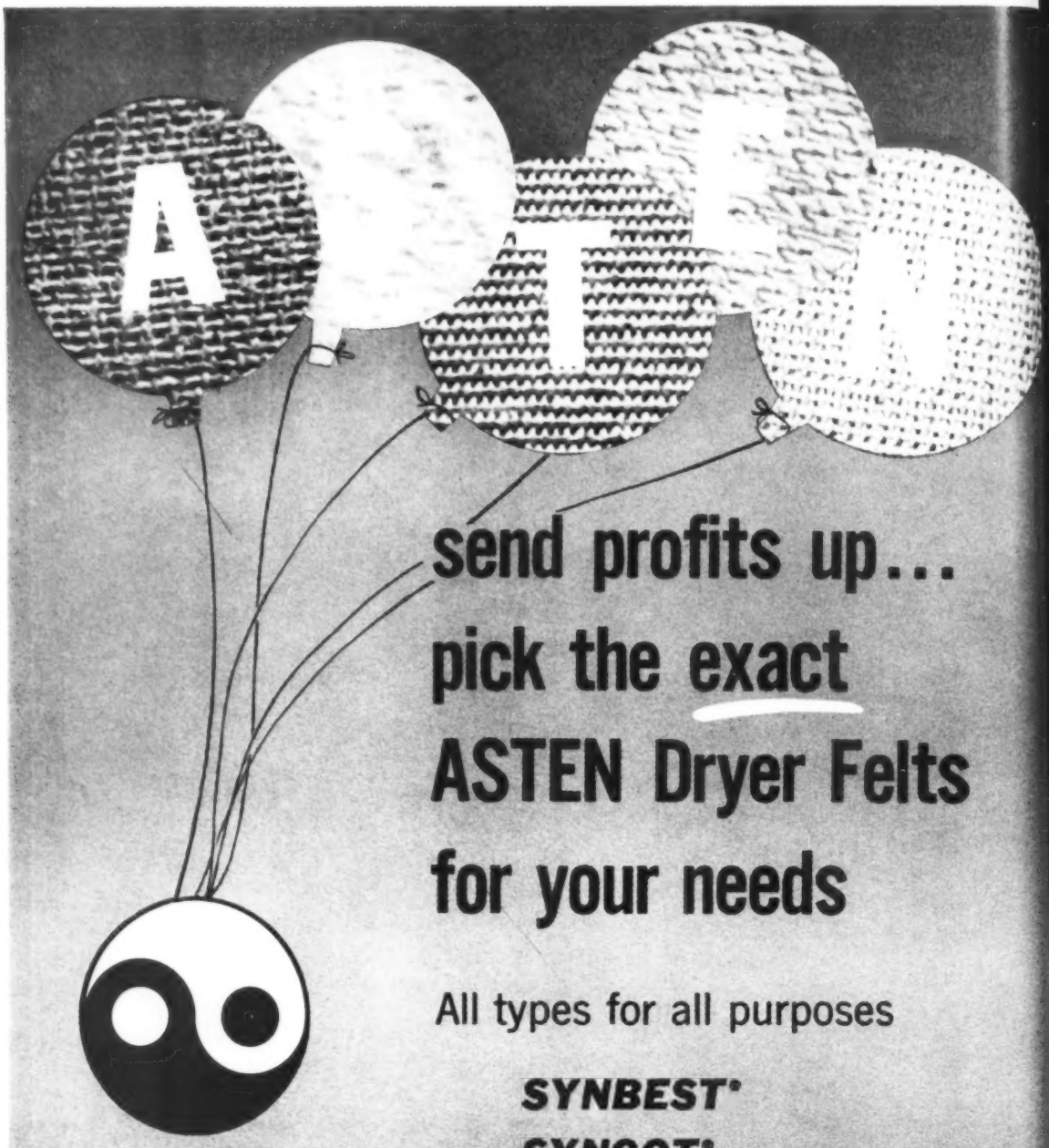

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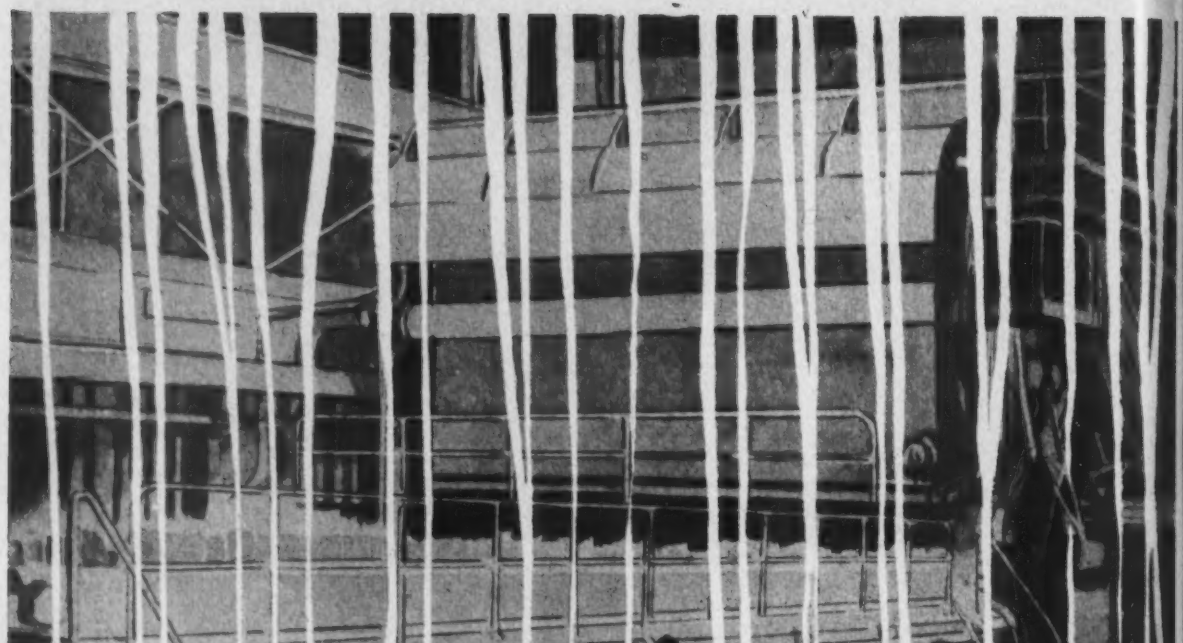

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Fritz Publications wishes all its readers and advertisers a very pleasant holiday season and a prosperous new year.

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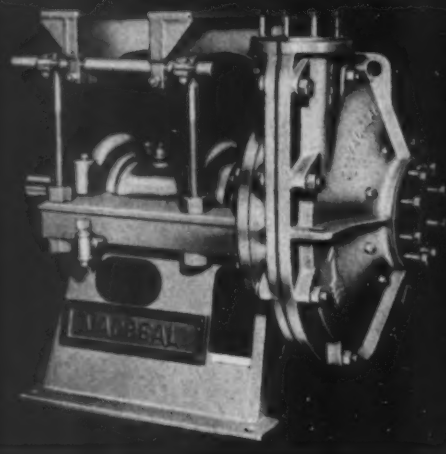

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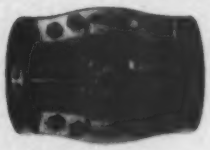

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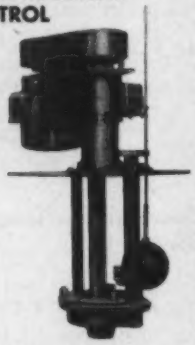

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from our point of view

Business Prospects for 1962

All signs point to an acceleration of business activity and an improved business climate in 1962. The recovery from the last recession is well advanced even in the absence of any signs of an impending business boom. The character of the 1961 business recovery which is proceeding in an orderly fashion is proof that we are finally learning how to be in better control of our cyclical "ups" and "downs". There is no doubt that new and substantial highs will be achieved during the coming year in production, sales, expansions and, to a lesser degree, in profits.

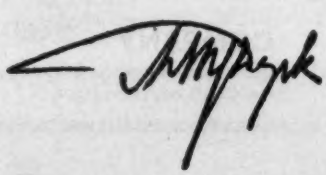
The underlying motivation of all business activity in 1962 will come from a stiffening of competition, both in the national and international markets. Increased competition on the international markets will be brought into sharper focus by the rapid developments in the integration and consolidation of the European Common Market countries which, when completed, may embrace a population of more than 300,000,000 people.

With increased international competition will come demands for both protectionism and liberalization of trade practices, depending on what school of thought we choose to follow. The consensus, however, seems to be expressed in the point of view that "The prosperity of any one nation does not depend on the poverty of other nations and that each nation's prosperity is promoted by the prosperity of other nations". Bringing this thought to a logical conclusion would tend, in the long run, to work against protectionism and toward greater international trade liberalization.

The question then arises "how can American business compete against lower wages, lower transportation costs, and unpredictable business practices in other countries when already we are faced with the discouraging trend of continuously declining profits?"

The rapid changes in technology militate against the expectations that some may have of radically changing the declining rate of profits. With the development of increasingly more efficient machines, with ever shorter periods of time required to translate research results into mass-produced output, the trend of declining profits on mass-produced items is likely to continue.

The solution, therefore, must be found elsewhere. The main profits will come from new products that temporarily dictate a high premium on the markets. Better profits will also result from better marketing techniques, diversification of markets and an intimate knowledge of actual and potential markets. All of these studies will put great demands on and test the ingenuity of first-rate market research departments.



New—from American Oil Company!

Super ESKAR*M . . . offering unique advantages for milk carton coating

by D. I. Walker

About the author:
"Irv" Walker's knowledge of milk carton coatings comes from more than 15 years' experience working with such products. He has been with American Oil Company since 1939. Irv has a B.S. degree in chemistry from Grinnell College, graduate work at both Iowa State University and the State University of Iowa. He also attended the Paper Short Course at Lowell Technological Institute, and completed his company's Sales Engineering School.

Super ESKAR M is a completely new, field-tested carton coating material that offers advantages not previously available to the dairy industry. It was specifically formulated by American Oil Company to afford cartons greater rigidity than products previously obtainable. It provides, in addition, many benefits of great importance in carton coatings.

Super ESKAR M imparts far greater rigidity to cartons, both immediately after filling and after storage. And even under adverse conditions of handling, it offers maximum adhesion qualities which virtually eliminate flaking.

This new product also was developed to provide improved flexibility where heavy films are found. It resists fracture under difficult coating stresses when handled at low milk storage temperatures.

American Oil research had the solution to another dairy problem in mind when formulating Super ESKAR M. Super ESKAR M was developed to assure good cleanliness on the coating machine and so to reduce machine jamming and stoppage due to coating material build up.

Super ESKAR M is a premium white product which provides extra protection to cartons under abnormal conditions and provides it at moderate added cost. It carries with it all of the benefits of the ESKAR line: complete freedom from color, odor and taste; high strength and durability; consistently good compatibility; unexcelled liquid proofness; better leveling in carton bottoms; sharper definition of print and design; and elimination of all mottling and serpentine effects on the package. And, of course, it meets current requirements of the 1958 Food Additives Amendment.

You can learn about the unique advantages of Super ESKAR M for milk cartons by contacting the American Oil office nearest you or writing American Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

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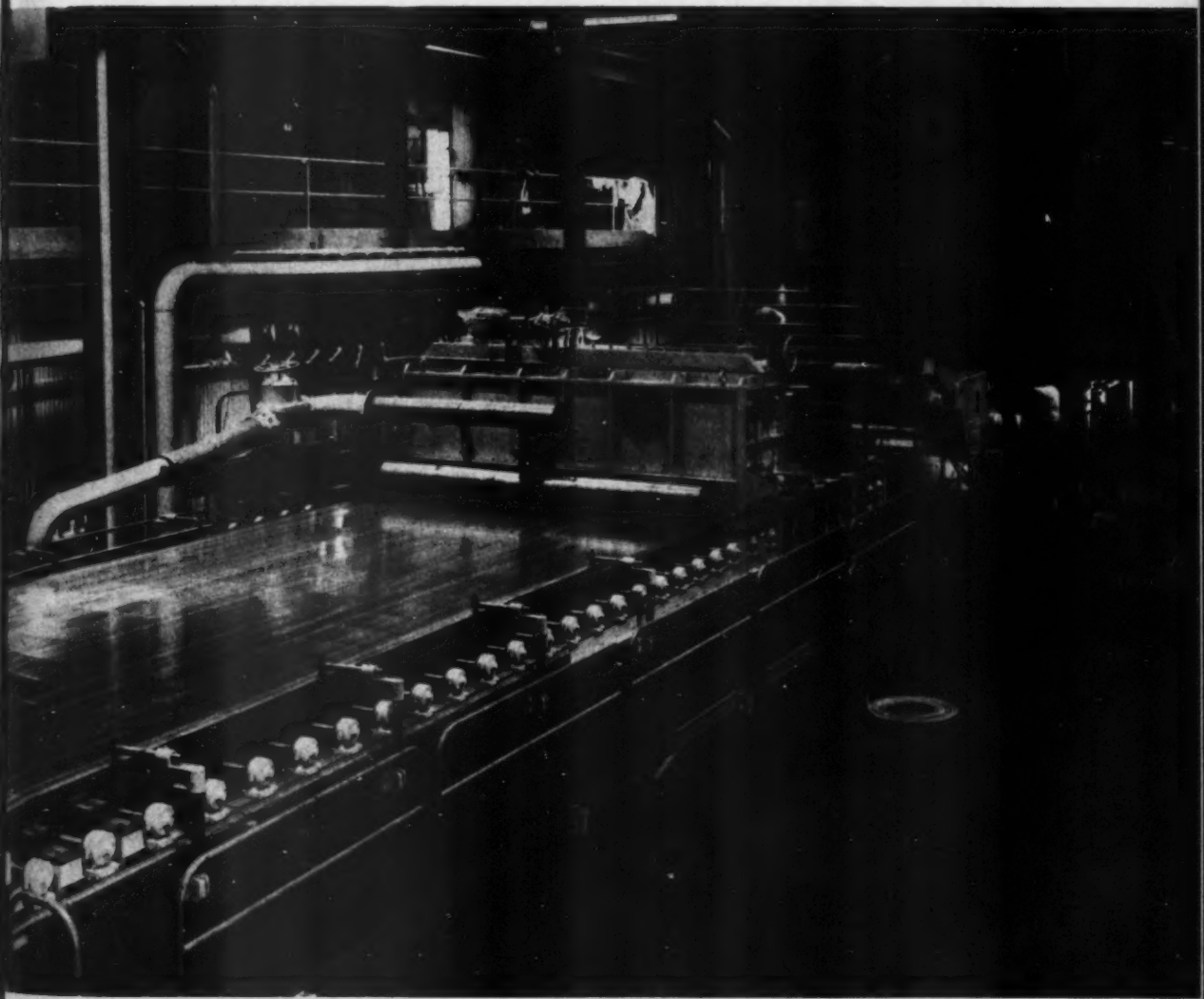

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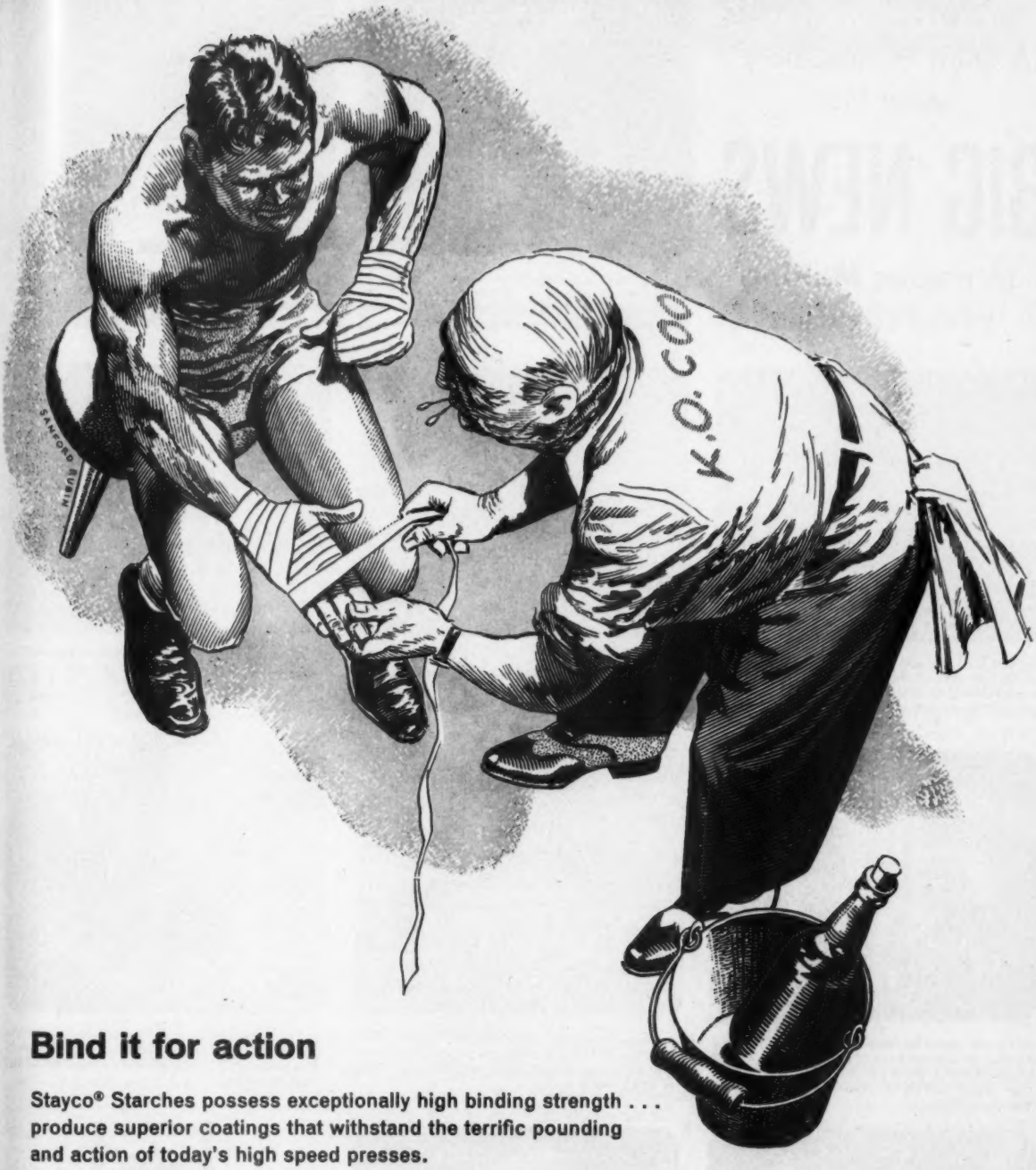

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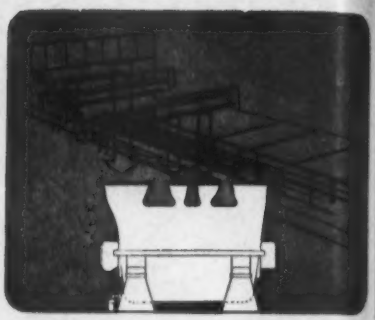
A Short Picture Story about the

BIG NEWS

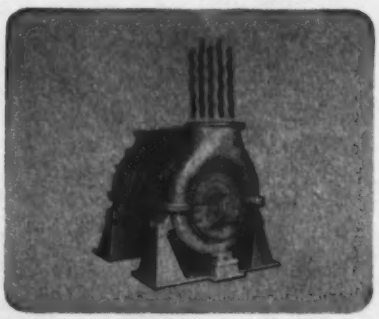
in Paper Making

1. It's the Ingersoll-Rand Central Vacuum System for paper mills — a new application for centrifugal exhausters that opens a new era for the American paper industry because...

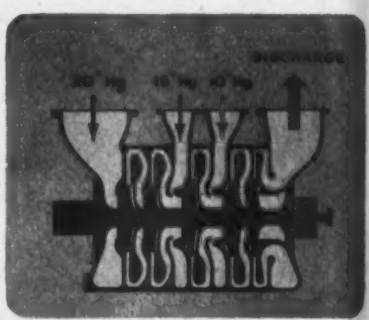


2. this one unit, with associated separators and controls, constitutes a complete system that meets all vacuum requirements for an entire paper-making machine. For example...

3. one 1,065-hp exhauster has taken the place of six wet vacuum pumps totaling 1,285 hp — a net saving of 225 hp! In addition to saving up to 25% on driver horsepower...

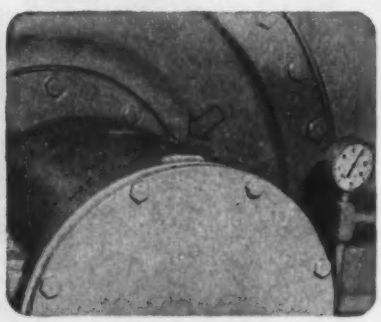


4. from 70 to 90% of its power is recovered as hot air for drying — saving the cost of steam and the capital investment for air heater equipment. All this is possible because...



5. the multi-stage centrifugal exhauster is designed with multiple inlets that provide three separate vacuum pressures as required by the installation. To see this innovation...

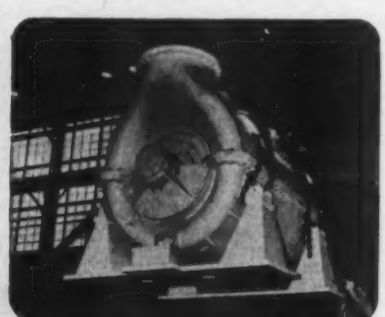
6. paper makers from all over the country visited an open-house demonstration at the Ingersoll-Rand plant, where the Central Vacuum System was in actual operation. Here they saw that...



7. the centrifugal exhauster ran so smoothly that a coin stood on edge on the bearing housing without a quiver. And, through a window in the casing...

8. they could see that the discharge air was completely dry, without even a trace of moisture, making it an ideal heat source for drying. This is due to...

9. the unique primary separators designed by Ingersoll-Rand — units that proved so efficient in removing moisture that secondary separators are used only for back-up protection. Later...



10. the first Central Vacuum System ever built in America was shipped to a leading paper mill. Two other systems are already on order. For complete information, send for Bulletin 8289.

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THE MARKET ORIENTED ENGINEER*

BENTON R. CANCELL
Executive Vice-President
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DESPITE the often-expressed fears of certain Federal Government Agencies that competition in the United States is lessening because of mergers and consolidations, the fact is that competition in the pulp and paper industry is aggressive and severe, both in domestic and foreign markets. Such competition has manifested itself in the rapid flow of improved products, new products and new processes — aimed at expanding market opportunities, reducing costs and expanding profits. The fact is, if one examines the financial record of the pulp and paper industry, that with very few exceptions, the trend of profits has been downward (almost in reverse proportion to new technical developments), both as a return on sales as well as on capital invested in the business.

Increasing competition

Moreover, competition has been increasing between the pulp and paper industry and the products of other industries, notably plastics in its various forms. Just as dissolving pulp, paper and paperboard made serious inroads into the consumption of silk, cotton, burlap and lumber in the respective areas of textiles, bags, boxes and other packaging, so we are now feeling the aggressive competition of synthetics in the pulp, paper and paperboard industries. Fortunately, intelligent technology and engineering have found that in many instances paper, paperboard and plastics complement each other and combinations of these materials have resulted in new products and new expanded markets.

But competition in the pulp and paper industry is not a domestic affair only. Competition from foreign producers, both at home and in overseas markets, has now become a fact of urgent importance to American industry. The remarkable technical and economic development in Western Europe and Japan has changed the entire complex of world trade relationships between our industry and the producing industries of these various countries. The easy time that prevailed immediately after, and for some years following World War II, and the period immediately following the Korean War, when there was a great unfilled domestic and foreign demand for the products of the pulp and paper industry, has vanished.

In the last decade, finished manufactured goods made up the bulk of American exports. But in the past seven years, exports of American goods have increased only 8 per cent while world trade in such items has increased 10 per cent. The balance of that increased trade is, of course, going to other industrialized nations. Significantly, during that same period our imports of finished manufactured goods has increased 250 per cent.

True, American exports of pulp and paper have increased beyond the average of other American goods during the seven years referred to, but such exports have fallen far short of balancing the overcapacity which has existed in the pulp and paper industry and at the same time, new foreign productive capacity has been expanding rapidly.

The establishing of trading blocs, politically so necessary to world peace (e.g. the European Common Market, the Outer Seven and the probable establishment of a Latin American Common Market), pose a further challenge to the American pulp and paper industry, for we no longer have a "corner" on technology and mass production methods. Nor has there been any evidence of an awareness on the part of organized American labor of the responsibility and obligations which they bear to help keep American industry competitive in this shrinking world.

Better goods at lower cost

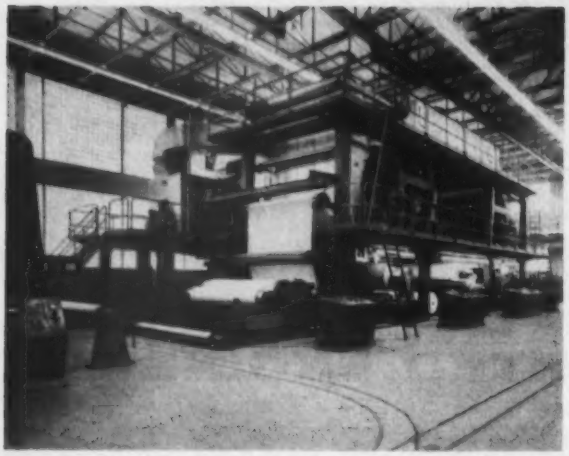
If, as individual companies, we are to meet this competition against other domestic producers of pulp and paper, of other domestic producers of substitute materials, and of foreign producers in both domestic and foreign markets, we must then be prepared to produce better goods at lower costs and to aggressively sell and service customers who may have a wide choice of suppliers and products from which to choose.

You may well be saying at this point "What has all this to do with me as an engineer? Is it not Management's responsibility to take care of these matters?"

No technical or engineering project should ever be undertaken as an end in itself. It must have some un-

Continued on page 595

*Abridged from the Keynote Address at the TAPPI Engineering Conference.



Two views of the Newton Falls Paper Co's. new Flexiblade coater developed by Black-Clawson's Dilts Division.

NEW FLEXIBLADE COATER AT NEWTON FALLS PAPER MILL

A. W. J. DYCK

The new 118-in. wide, 2,500 fpm., uniquely designed coater incorporates two Flexiblade coaters, one air-knife coater and three 3-D high velocity convection air dryers.

THE RECENT installation of a 118-in. wide, 2,500 fpm Black-Clawson Flexiblade off-machine coater at Newton Falls Paper Mill Inc., provides this company with one of the most modern and uniquely designed coating systems. It should, when in full operation, give Newton Falls a decided advantage in its output of high quality coated enamels, book, envelope, offset, etc., papers.

The new highly automated coating unit, which incorporates two Flexiblade coaters and one air-knife coater, supplied by Dilts Division, and three air dryers, from Black-Clawson's Air Systems Division, will replace two off-machine, air-knife coaters used until recently in the production of these paper grades.

The advantages inherent in the new Flexiblade coater include: (1) a pressurized air-loaded deckled coating chamber, equipped with a pressure-sensing device and Saunders valve for controlled feed; (2) an air-loaded, flexible coating blade — equipped with loading tube, locking tube, and profilers — designed to deliver a smooth, pattern-free coating; (3) the ability to use high solids coatings (in the range of 60 to 70 per cent) which require less drying time and less adhesive, give higher brightness, and reduce the tendency of the coating to migrate into the sheet; and (4) high speed operation in the neighborhood of 3000 fpm. now mechanically possible.

The new coater is housed in one section of a new 432-ft. long and 121-ft. wide building of cement block, ceramic tile, and glass block construction.

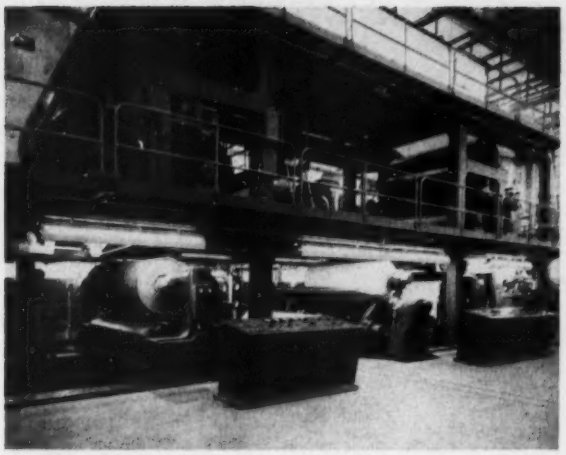
Coating preparation and its flow system

Coating ingredients for the blade coaters are measured into two 330-gal. cap. Abbe mixers of stainless steel construction and equipped with high-speed impellers driven at two speeds by 60-hp motors.

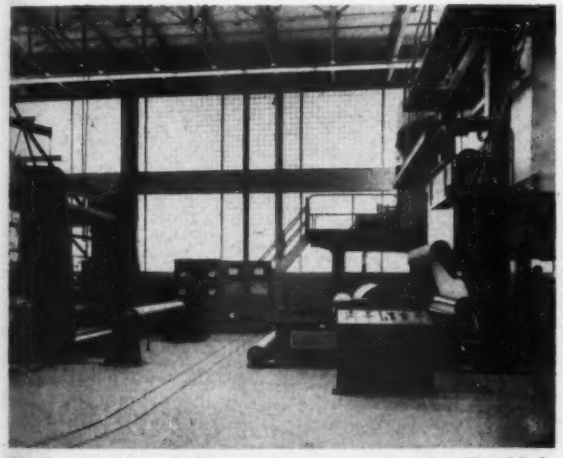
The mixed coating is then pumped to one of four stainless steel, 1500-gal. cap. storage tanks. The purpose is to have two storage tanks for each blade coater. The coating is then screened in two 100-mesh Tyrocket screens and pumped to a feed tank. From here it goes through another screen to a 250-gal. cap. small feed tank which supplies the chamber of the blade coater.

The coating mixture for the air-knife coater is prepared by first cooking the starch in a starch cook-

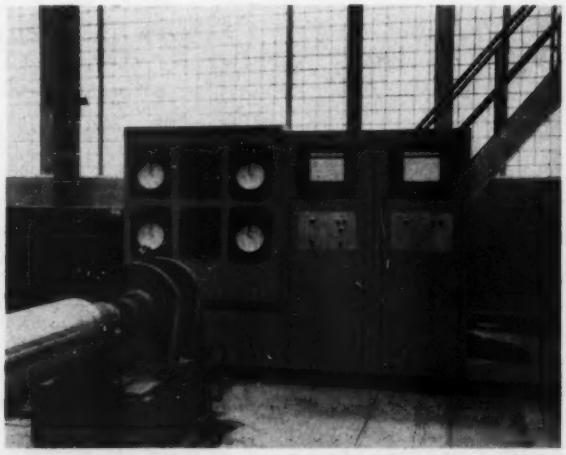
View of the Abbe mixers and storage tanks — all of stainless steel construction.



A more detailed view of the Flexiblade coaters, coating chambers and 3-D high velocity air dryers.



Winding and unwinding equipment serving the Flexiblade coater.



Close coating and drying control is maintained by an elaborate set of instruments.

er and then mixing it with clay and other ingredients in one of the Abbe mixers. The coating is screened while en route to the air-knife coater.

Moyno pumps are used throughout in all pumping operations involving the coating mixtures.

The coater

The 118-in. wide coater, designed to operate at speeds up to 2,500 fpm, is equipped with two coating blades and one air-knife coater. Its flexibility of operation is such that it can be used for blade coating of one or two sides of the sheet, or air-knife coating alone of one side of the sheet.

The flexible coating blade, made of specially developed steel to insure a uniform rate of wear, is held by a pneumatic locking device and a pivoted retractable clamp assembly to facilitate quick blade changes. A loading tube permits variation of the coating load on the blade, while 1-in. wide profilers set along the blade across the width of the machine are used for final blade adjustment that may be demanded by individual blade characteristics and to correct the possible occurrence of wet-streaks.

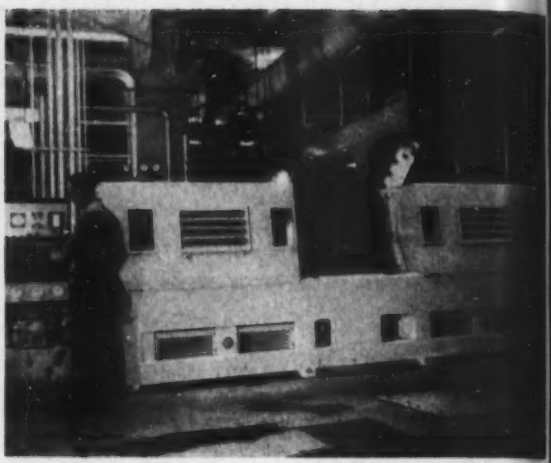
The enclosed stainless steel coating chamber, into which the coating is fed, is equipped with edge dam seals that can be adjusted to correspond with changes in web widths and variations of chamber-pressure. The coating chamber has multiple port inlets designed to produce a diffusing flow pattern to insure a uniform distribution of the coating throughout the chamber. A pressure-sensing device in the chamber operates in conjunction with a Saunders valve for automatic control of the coating pressure in the chamber within an operating pressure range of 10 to 50 in. of water.

The coating chamber can be retracted in case of a web break. It is also equipped with a quick dumping device to prevent spilling of the coating during machine stops, web breaks and other emergencies.

Flow of the coating into the chamber, as well as out of the chamber and through the recirculation system, is measured and controlled by magnetic flow meters. The difference between incoming

Continued on page 595

THE BAUERITE PROCESS



Bauer Bros.' 3,000-hp., No. 480 Double Revolving Disc Refiner.

This article is Paper Industry's evaluation of current developments of the Bauerite process as applied to the latter's application to mechanical pulping of coniferous woods.

THE BAUERITE process produces a mechanical-type pulp by fiberizing chips in a high-speed Double Disc Refiner.

This process of making a groundwood-type pulp from chips was first accomplished in the Bauer Laboratories during the period 1954 to 1956. It was soon discovered that the new process lent itself to the utilization, in chip form, of all softwood species and some hardwoods, and that the pulps obtained showed superior physical properties compared to those produced by the conventional stone groundwood system.

The Bauerite process aroused considerable interest in the pulp and paper manufacturing industry and it was not very long before it found its place in a number of commercial operations.

The potential economical advantages of the system, which derive from (1) the replacement of chemical pulp; (2) the use of lower cost raw materials; (3) lower capital investment for buildings and equipment; and (4) lower operational costs that should be obtainable with improved process control, makes this a very attractive operation for the pulp and paper industry.

The Bauerite process, as subsequently developed, lends itself to the production of (1) all-mechanical pulp from untreated chips; (2) pulp from sodium sulfite pretreated chips (such as obtained in the Impressafiner) and (3) pulps obtained by the above-mentioned methods with inter-stage classifications.

The discussion in this article is mainly concerned with the application of the Bauerite process to coniferous woods. Numerous periodical articles have described the procedures and products obtained by the Bauerite system from hardwoods, in which cold caustic and hot sulfite impregnation are involved.

All-mechanical pulping

Chips ground in the Double Revolving Disc Refiners yield a pulp of relatively more uniform fiber content than is possible with the stone grinding operation which has the additional disadvantage of yielding an excessive quantity of fiber-debris and fines.

In the stone grinding operation, many fibers are aligned more or less parallel to the stone surface and, in the process of being removed from the wood, may be cut across the fiber axis by the stone grits. Evidence of this action is apparent from an examination of the groundwood fibers under a microscope which shows groundwood fibers appearing mainly as short and rigid pieces among a comparatively large quantity of fiber debris and fines.

A microscopic examination of pulps prepared from chips by the Double Disc Refiner shows the presence of a large quantity of long flexible fiber elements developed by opening and unraveling the outer layer of the fiber wall. The cellulosic layers of the walls of many fibers are exposed, thus providing a material with excellent bonding and strength properties.

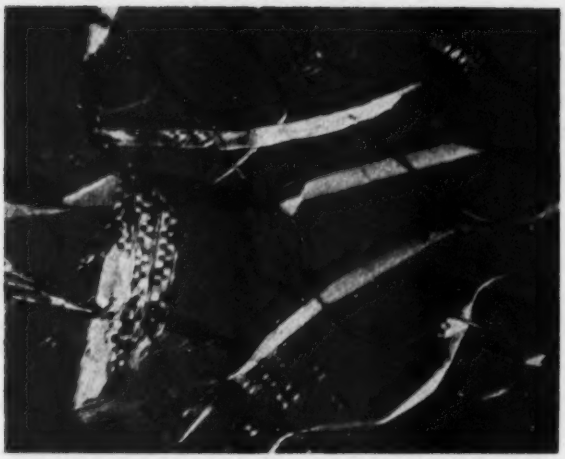
The plate pattern has a marked effect on the movement of chip material through the refiner and its consequent breakdown into high grade pulp. For this reason, Bauer Bros. Co. is paying special attention to a continuous improvement of plate design.

Pulp from pre-treated chips

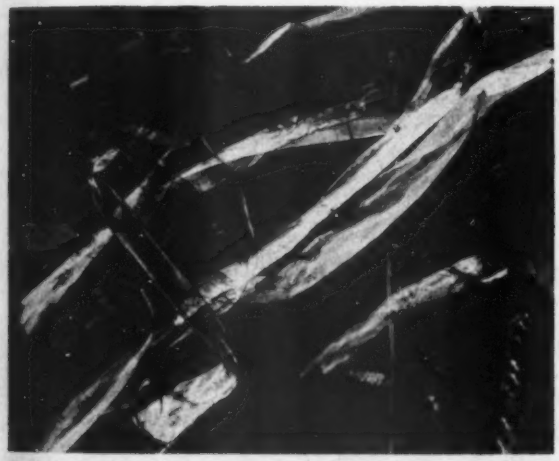
Pulps produced from softwood chips preconditioned in the Pressafiner, or impregnated with sodium sulfite in the Impressafiner, contain fewer "flour" fines and more fibers in the form of flexible ribbons, veils and membranes, as can be seen from a microscopic examination. The fibers are open, soft and flexible, and seem to approach, in some respects, the properties of unbeaten sulfite pulps.

These physical characteristics are in line with the observed superior properties of the pulps and support

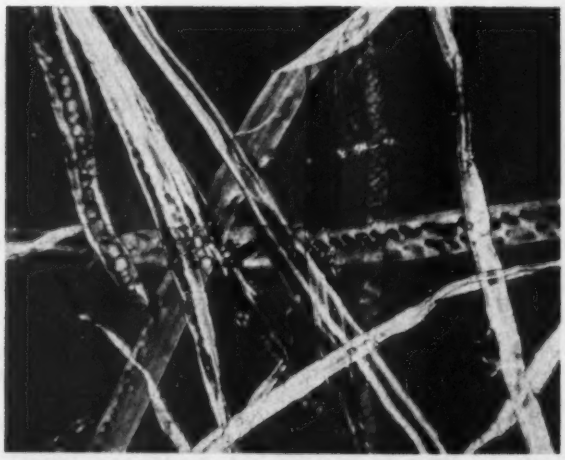
Deckered stone groundwood pulp from Eastern Canadian newsprint mill.



Bauerite pulp—all mechanical reduction of chips in Double Disc Refiner.



Bauerite pulp—chips pre-treated with 3.5 per cent Na_2SO_3 in Impressafiner prior to Double Disc Refining and cleaning.



Sulfite pulp for newsprint furnish from Eastern Canadian newsprint mill. All pulps shown consist of 78 per cent black spruce and 22 per cent balsam fir.

the theory that a partial pulp strength development has taken place due to subjecting the chips to the high pressure of the screw press. It should also be noted that this partial strength development has been achieved with a minimum of cutting or damage to the fibers and at a relatively low expenditure of power.

Classification

The Bauerite process has the advantage of permitting a better control of uniformity of the feed material. This is accomplished by proper chipping of the wood, followed by screening and conditioning of the chips to maintain uniform moisture content.

Factors such as the variation in density, the proportion of summerwood and springwood affect the uniformity of wood. The flexibility of the Bauerite process makes it possible to arrest the fiberizing action (e.g. by Centri-Cleaning or Selectifier screening) at a point where a maximum quantity of undamaged fiber has been developed, separate the oversize fraction for further refining, and blend it with the accepted fraction. In this way a pulp of superior uniformity and quality can be obtained.

In summary, a wide range of characteristically different pulps from a single species of wood can be produced by variation of refiner speed, plate pattern, consistency, pre-treatment, and power input.

Potential of process

The versatility of the Bauerite process makes it possible to produce pulps that range in properties from those resembling groundwood pulps to those of unbeaten sulfite pulps.

Actual experience and tests have also shown satisfactory or superior smoothness, porosity, fold and printability characteristics. There are also indications that these pulps have consistently greater wet web-strength values compared to those of conventional groundwood.

A visual comparison of fiber characteristics of Bauerite pulp with those of stone groundwood and sulfite pulp is shown in the four photomicrographs.

CHOOSE THE RIGHT PAPER COATING FOR BETTER PRINTABILITY

PETER W. SHERWOOD

Research Engineer

▶ The key to improved printability lies in the choice of coating materials, their formulation and in the method of applying the coating.

IN PRODUCING high-quality copy, the printer looks for papers having good reproduction, ink holdout, sharpness, realism and contrast. In terms of paper quality, this requires high brightness, uniformity, opacity, ink receptivity, gloss and, above all, surface smoothness under printing pressure. These properties, which together define print quality, may be substantially improved by choice of a suitable surface coating.

The key to achieving such improvement rests in the choice of coating materials, their formulation, and in the method of applying the coating.

Raw materials

In principle, coatings applied for improved printability consist of two components: pigments which fill the pores in the paper and provide a smooth surface, and adhesives which serve to hold the pigment in place. Furthermore, various additives such as defoamers, dispersion agents and preservatives are provided.

Almost universally, the pigment is a mixture of inorganic materials. Coating clays serve to improve ink absorption. Calcium carbonate or whiting is frequently admixed to the clays in order to provide non-uniform particle shapes, thus permit use of larger clay particles. To increase opacity and whiteness, titanium dioxide is employed.

Adhesives fall into two main categories: natural products such as starch, soy protein and casein, and synthetics such as acrylics, styrene-butadiene and polyvinyl alcohol.

The natural binders are by far less costly, thus find the largest consumption. O'Donnell (1) estimates that 80 to 120 million pounds of starch is consumed annually in the United States as adhesive for paper coatings. In second place is casein with an annual consumption of 35 million pounds. Each has its particular drawbacks. Starch has to be applied at high rate (18 to 25 lb. per 100 lb. clay compared to 12 to 15 lb. for most of the other binders, 3 to 5 lb. for polyvinyl alcohol), and has relatively low wet-rub resistance. These starches may be chemically modified (ethoxylated) to improve their jelling resistance.

Casein has higher wet-rub resistance than starch, is therefore more suitable for offset printing purposes which require "wet pick resistance," i.e. ability to withstand a tendency of the offset printing press to remove coating from the paper.

A highly significant improvement in paper coatings has come with the introduction of synthetic latices. According to O'Donnell, styrene-butadiene latex is consumed in this service at an annual rate of about 30 million pounds. This is followed by acrylics (8 million pounds) and vinyl alcohol polymers (about 2 to 3 million pounds). These synthetics are relatively expensive (30 to 60 cents per pound). They are rarely used as such but are incorporated into the coating together with natural adhesives. They serve to improve wet-rub resistance, smoothness, flexibility and gloss.

Each of these synthetics has its particular area of application: styrene-butadiene latices are used most widely, serve in almost all printing stocks and processes. Acrylics are of particular importance in the food field because of their negligible odor. Polyvinyl alcohols are of particular interest in the production of highest-quality printing paper, because their low permissible rate of application improves ink receptivity when compared with other adhesives. Furthermore, its low rate of application makes polyvinyl alcohol potentially one of the most lowest-cost adhesives for paper coating. Thus, this recently in-

SORRY. THIS IS THE BEST PICTURE WE COULD GET OF POLAR-6

You see, this brand new chemical treatment, (it's a Huyck exclusive, of course) makes papermaker's felts *colorless* . . . permanently! This remarkable new treatment resists color change caused by ultraviolet light, heat, chemicals and age. We named it . . . POLAR-6.

We created POLAR-6 for use where colored treatments can't be used. POLAR-6 provides the outstanding advantages of Huyck's established treatments *without* color.

Hundreds of field and laboratory tests have been conducted with POLAR-6, covering size stability, resistance to abrasion, plugging and bacterial damage. We'd be happy to send you some of the eye-opening results of these tests. Just drop us a line at Rensselaer or . . . Ask your Man from Huyck.

HUYCK FELTS

Huyck Felt Co., Rensselaer, N. Y.; Aliceville, Ala. • Division of Huyck Corporation • In Canada: Kenwood Mills Limited, Arnprior, Ontario

troduced binder shows particularly good promise for wide use in the paper coating field. It still has a major drawback: slow development of wet-rub resistance. Until this problem is overcome, the large potential of polyvinyl alcohol as adhesive in paper coatings will probably not be realized.

Coating formulations

Coating formulation depends on the adhesive used and on end use requirements. Solids content should be high (about 60 to 65 per cent), otherwise streaking is observed. Typically, the formulation contains 85 per cent pigment, 12 to 15 per cent adhesive including the small amounts of additives referred to above.

Even higher solids content is feasible with polyvinyl alcohol formulations, while use of starch restricts pigment content to about 80 per cent.

In formulating a paper coating for printing purposes, attention must be paid not only to the printing characteristics but also to the requirements of the machine employed in applying the coating. For example, use of the trailing blade method results in low coating weight. The coating therefore provides relatively little hiding power, and it is essential that the paper stock itself and the coating have nearly the same color in order to avoid a mottled appearance.

In the case of roll coating, patterning is frequently observed, i.e. portions of the wet coating are pulled off by the applicator roll, and this results in a spotted appearance of the paper surface. Wolfe (3) has been able to overcome this difficulty by incorporating a reactable or hardenable binder into the coating formulation, and then passing the coated sheet between rolls by which a hardening solution is applied to the surfaces. For example, this objective can be achieved by incorporating carboxymethyl cellulose as hardenable component and aqueous alum (4 to 5 lb. per 10 lb. water) as hardening solution.

A typical formulation consists of 1.5 per cent CMC, 10 per cent modified starch, and 3.5 per cent styrene-butadiene latex, 15 per cent calcium carbonate and 70 per cent clay. This coating is applied at the rate of 10 to 30 lb total weight to both sides. However, Wolfe points out that very heavy coats formed from this formulation may be ruptured in the course of the hardening treatment. For production of very heavy coatings, he therefore recommends use of about 12 to 15 lb. reaction coat over conventional roll-coater base coat of 12 to 15 lb.

Effect on printing performance

Crane and Majany (4) have investigated the effect of a number of variables in the coating process on key printing requirements with the following main conclusions:

1. Lack of uniformity in the distribution of the coating may be responsible for strike through in the printing process or for a break on the printing press.

2. Printing smoothness of the stock is affected above all by the coating formulation's flow properties at the coating nip and on the manner in which the coating is applied. In the main, the coating's flow properties are determined by the adhesive type and concentration. No general rule can be provided here. However, the flow properties of the system are influenced significantly by the dispersing agent.

Casey (2) finds that starch coatings should be formulated with more dispersing agent than is needed for minimum viscosity, while in the case of casein binders the minimum amount of dispersing agent should be employed.

3. Ink receptivity decreases with increasing binder content in the coating. At equal quantity of casein and starch, the latter provides the more ink-receptive surface. However, as we have noted above, less casein may be used to achieve a particular wet-pick resistance, so that for practical purposes these two natural binders are equivalent in ink receptivity. The advantage of polyvinyl alcohol in this regard has already been noted.

The ink receptivity characteristics are influenced significantly also by the character of the pigments. Calcium carbonate, for example, is superior in this regard to clay.

4. Surface strength of the coating is increased with rising adhesive content. Bonding power of the available adhesives varies widely. It is lowest in starch, highest for PVA.

5. Wet-rub resistance is a function of the binder's chemical structure. It is lowest for unmodified starches. Ethoxylated starch presents an improvement and casein may be rendered sufficiently wet-rub resistant by treatment with formaldehyde, etc. In general, the synthetics show the best performance from the point of view of wet-rub resistance.

Methods for applying the coating

Coatings to promote the printing characteristics of paper are applied mainly by one of three methods: roll coaters, air-knife, and blade-type coaters. The finished product derived by the various processes differs in applied weight. Furthermore, the coating formulation must be adjusted to the coating method employed, since each calls for different rheological properties in the material. Thus, formulations for air-knife application have free-flowing, low-viscosity character while roll-type coaters call for a relatively viscous formulation. Blade coaters call for formulations of intermediate flow characteristics.

While a discussion of the various mechanisms employed for application of coatings is beyond the scope of this article, attention must be given to their effect on the properties of the coating.

Blade-type coaters are capable of providing the highest degree of surface smoothness and are therefore increasing in popularity. However, coaters of this type are quite limited in the coating weight which can be applied per unit surface.

In air-knife processes, excess coating is applied to the surface and the excess is then removed by air blowing. The method permits large variation in the thickness and solids content of the coating. Furthermore, it owes its popularity to simplicity of equipment. However, air-knife coating may result in streaking, patterning, and non-uniform leveling.

The use of roll-type coaters is particularly suitable for application of coatings of high solids content and in high weight-per-unit surface. Its principal drawback is patterning action.

Trailing blade applicators are characterized by outstanding leveling action, high product smoothness and good utilization of coating material. On the debit side, such equipment tends to cause streaking. Furthermore, because the weight of coating which can be applied by the trailing-blade method is severely limited, it is necessary to employ coatings with essentially the same color as the paper stock in order to avoid formation of a mottled appearance.

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WHY AND WHERE ISOTOPES SHOULD BE USED IN THE PAPER INDUSTRY

E. M. AMBERG JR.
Industrial Nucleonics Corp.

According to a recent survey, industrial users of radioisotopes saved $39,100,000 in the years 1957 and 1958 with an expenditure in equipment of only $3,700,000.

THE National Industrial Conference Board recently mailed questionnaires to all industrial users of radioisotopes. The result of the survey showed that these companies, many of which are operating in the pulp and paper field, saved, in the years of 1957 to 1958, $39,100,000 with an expenditure in equipment of only $3,700,000.

This report also showed that the companies surveyed improved quality, increased efficiency, and reduced costs by using measurement and control techniques made possible by the use of isotopes. In essence, the "peacetime atom", used as a measurement tool, increased net profits after taxes on a current year basis.

Users of radioactive isotope measurement systems enjoy increased machine efficiency and improved quality of product while raw material costs are reduced. It was also discovered, through experience, that five requirements must be met to obtain a maximum return from an isotope measurement and control system. These are: (1) The intended application had to be analyzed carefully to see what economic and quality returns would result from the installation of a continuous measurement and control system. (2) When the returns had been estimated, the actual equipment required, its location, integration, and compatibility with the process involved had to be determined. (3) The next step was to insure proper supervision of the program.

This meant the proper installation, adequate instruction of operating personnel, and compliance with all safety requirements. (4) With the system operating, the actual results obtained must be determined and compared with the predicted results. (5) Once satisfactory results from the system had been obtained, a constant review of the program must be carried on to insure a continuance of return.

Where should isotopes be used in industry

The field of atomic energy has been effectively categorized by P. C. Aebersold of the Atomic Energy Commission into the areas of: (1) The military interest, which is concerned with the national defense apects of atomic energy; (2) The generation of heat for conversion to electric power; (3) The effects of radiation on materials. This includes experiments in the preservation of food through irradiation, development of improved strains of plants through accelerated mutations, and the induction of chemical reactions through exposure to strong gamma fields; and (4) The effects of materials on radiation. To date, the greatest number of commercial and industrial applications of radioisotopes has occurred in the area of affects of material on radiation fields. That is to say, one can determine certain physical characteristics of materials when they are placed in radiation fields. Among the properties disclosed are density of liquids, weights of solids, and thickness of sheet materials. This technology is based on measurement of effects which are produced in a radiation field by placing a material in that field and observing the effects by use of a radiation detector.

Absorption or radiation

This article restricts its subject to the fourth area, that of the effects of materials on radiation. There are two basic principles presently used in the area of the effects of materials on radiation. In this case we find thickness and weight measuring devices. The principle involved makes use of radiation, emitted from the bottom unit containing the radio-active isotope, which passes through the sheet being measured and is detected by the detector in the upper unit. The thicker or heavier the sheet, the less radiation is received at the detector. This function can be plotted for any thickness or weight of a given material and a calibration can be established.

A typical installation on a fourdrinier machine is shown in Fig. 1. Here we see the source and detector unit mounted on a traversing unit which permits measurement completely across a moving sheet. The source detector unit can be located after the stack and preceding the reel. The unit could also be located at other places on the machine and could be of a different source-detector type.

In this instance, the measurement signal is fed to the electronic console shown above the source-detector unit. This console is generally

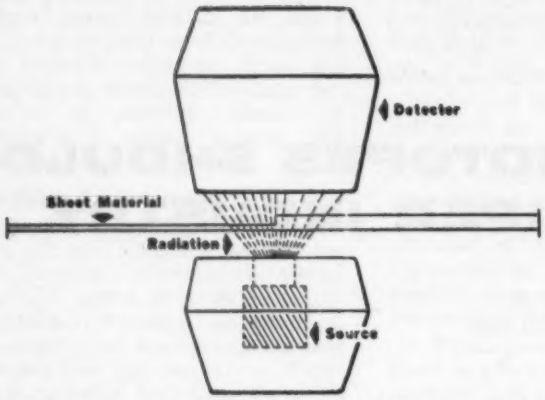


Fig. 1. Penetration of radiation is inversely proportional to sheet thickness.

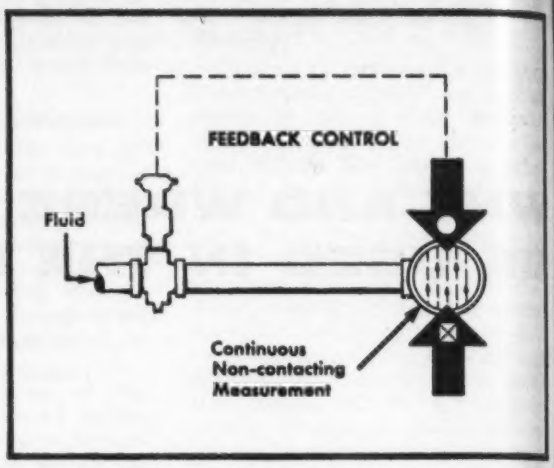


Fig. 2. On-stream composition analysis and process control.

located in an area remoted from the paper machine. It could be located as far away as 250 ft.

In a convenient installation the basis weight being measured is presented on the operator's station located over the wire. This station houses all the necessary operator's controls, the automatic control panel, and indicating devices to provide operating information to the machine tender. The unit is located in a convenient position for the operator.

The bottom recorder, in the Operator's Station, presents the profile of the basis weight as the gauge scans across the sheet. On the return scan the target weight is shown as a straight line. The scale on this recorder shows the position of the slice screws. This enables the machine tender to reference the weight variation to the appropriate slice screws and make the necessary adjustments. Because six to ten profiles per reel are obtained, more uniform profiles result.

The top recorder, on the Operator's Station, presents the averaged basis weight of each scan across the sheet. This is presented as a straight line on the scale that reads in absolute basis weight. The actual weight seen by the gauge is then compared to the target weight. If this weight varies from target more than is desired, a signal is fed to the automatic control, contained in the second electronic console. On receipt of the signal, the control opens or closes the stock valve or stuff gate to

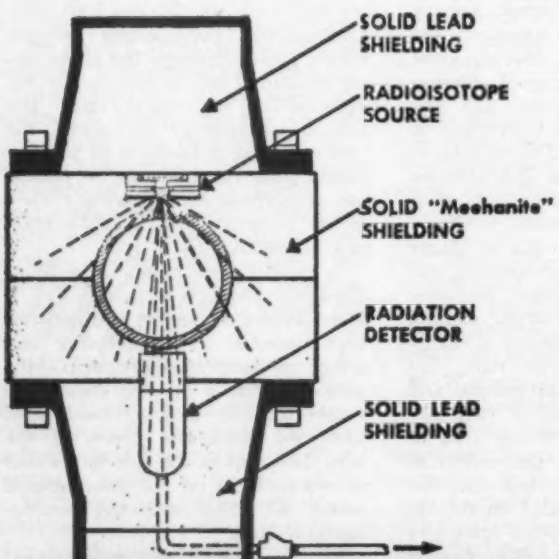


Fig. 3. Model DH-2 Measuring Head.

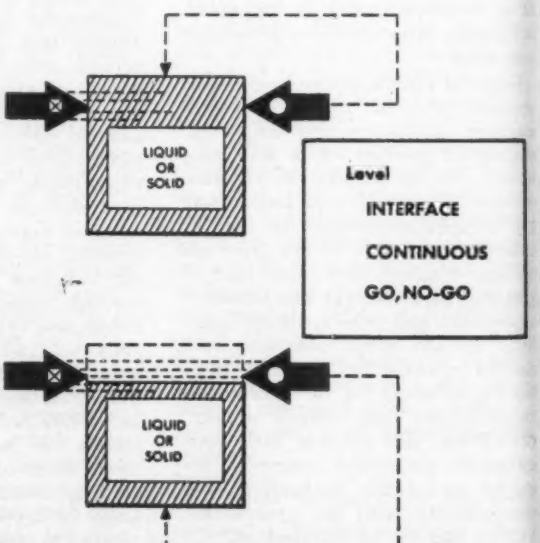


Fig. 4. Non-contacting measurement using radiation blocking principle.

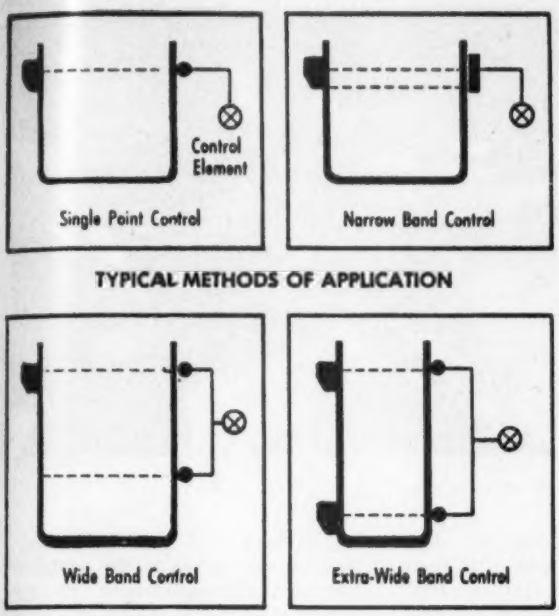


Fig. 5. Level detector-controller systems.

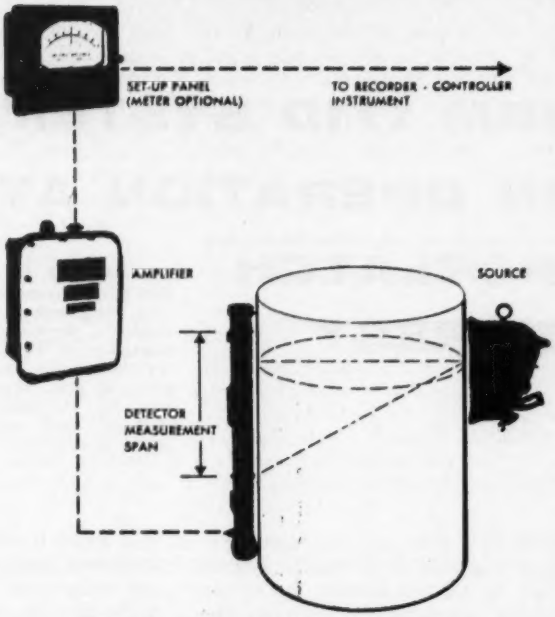


Fig. 6. Continuous level measuring system.

make the appropriate correction to basis weight.

Presently, there are more than 150 AccuRay Basis Weight Systems on fourdrinier and cylinder papermaking machines. More recently, systems have also been installed on off-machine coaters. More than 177 systems are installed on coaters and gummers. Also, more than 140 systems have been installed on extruders and extruder laminators. Different types of source detector units are designed to do specific measurement jobs.

U-frames are used in a number of applications. These are available for sheet widths up to 160-in. Special source detector units are designed for the metals industry and are used on high-speed, steel tandem mills. These weigh in excess of 2500 lb. to give you an idea of the ruggedness of design.

Another application of the absorption principle of radiation is used in the measurement of fluid, slurry, and in some cases, solids streams. Fig. 2 depicts this principle.

Fig. 3 shows a section through an actual Composition Analyzer Source Detector Unit. The process pipe is shown in the center.

Briefly stated, the complete system consists of a source detector unit, impedence matching unit and electronic console. The signal can also be fed to a recorder or recorder controller for manual or automatic control of the process.

These Composition Analyzer systems are being applied today in pulp and paper mills for black liquor, lime and slurry, white liquor, calcium hydroxide slurry, clay slurry and clay-starch slurry measurements. They are also being used to control evaporation, absorption, extraction, drying, mixing, classification, filtration, size reduction, materials handling, and filling operations in industry.

Blocking of radiation

In this case we find level measuring devices. Fig. 4 illustrates the blocking of radiation principle. The mass of liquid or solid material blocks the radiation between the source and detector. This principle can be used for detecting levels in vessels with solid walls, such as steel and concrete, without having any contact with the material within the vessel.

Fig. 5 shows this principle being used in single point control, narrow band control, wide and extra wide band control.

Fig. 6 shows how by extending the detector this principle can be used to continuously measure the level of material in a tank or bin.

These level measuring devices are of interest in pulp mills for level measurement in a number of areas. Digester level specifically has received considerable interest. Since this type of measurement system was introduced some three years ago, over 400 devices have been installed.

There are some other interesting applications of this device. Since it can "see" through solid walls, it can be looked at as a sort of gamma radiation photo cell. It can be made to disregard foam, froth, dust and other gaseous materials. It will average out turbulence and occasional interrupting matter such as agitators and paddles and will be unaffected by them.

As an example of the application of a leveling device, two level switches are used on a standpipe feeding powdered coal to a boiler in a power station. The radiation passes through the stream of powdered coal. If the coal bridges the pipe, the radiation is cut off and the switches shown initiate a shaking action to remove the coal build-up.

Of course, the one outstanding advantage of these systems is that level, density, weight, or thickness can be accurately measured without contacting or without affecting the measured material.

IBM 1710 SYSTEM IN OPERATION AT POTLATCH FOREST

Left to right: D. M. Bates, instrumentation engineer; D. Keller, production manager; E. C. Rettig, executive vice pres. & gen. mgr.; and W. V. Vallandigham, vice pres. paper converting.

THE IBM 1710 process control system installed at Potlatch Forests Inc. is an un-stream, open-loop digital computer. It includes the new 1711 data converter which translates instrument readings into language understood by a computer, and the solid-state 1620 data processing system. The 1710 records, stores, analyzes and reports the converted data in immediate visual form to paper makers, including technicians who control the process.

The system, using Minneapolis-Honeywell pressure-to-current transducers, is currently connected to 46 points on the fourdrinier, or "wet end", of the Potlatch machine. Eventually it will be tied into the paper machine at more than 200 points along the process line and produce information for the operators on a scheduled basis. It will also tie in other unit operations of the paper-making process including the pulp mill, stationary continuous digesters, caustic plant, bleach plant, coating systems, etc.

Emphasizing the significance of the new control system, Edwin C. Rettig, Potlatch executive vice president and general manager, said: "We can now do something we were never able to do before — electronically feel the pulse of our unbelievable complex paper machine at many different points each minute. The quality and production control possibilities this new technique makes available to America's fifth largest industry seems limitless even at this early date".

How the system works

The signals measured and transmitted by process instrumentation enter the computer room — a 16-ft. by 20-ft. air-conditioned enclosure-and are fed to a common terminal box which is wired to the 1711 data converter containing analog to digital equipment. The 1711 converts the 4-20 milliamp signal to a digital value in the range of 0000 to 9999.

This value is read into the 1620 computer and the computer program scans and converts this value to the proper units, i.e. gpm, psi, etc.

During a log cycle, all instrument values are typed on a 24-in. carriage typewriter.

The computer also receives, by a remote manual entry device, test results from the paper test laboratory which are logged out on a separate typewriter.

A third typewriter is located on the console and is used for communication with the computer.

The 1710 system reports to the operator via high-speed typing, pinpointing trouble spots in red. The operator can then make the necessary changes after evaluating, in the light of his own experience, the information he has received.

Among the ultimate objectives of this installation are:

1. Predict quality test results while paperboard is being manufactured.

2. Provide operating guides for operators during grade changes.

3. Monitor the process during runs.

4. Produce a log sheet of all variables at 10-min. intervals.

5. Continuously scan instrumentation and log out in red any off-normal condition encountered during the run.

Advantages of the 1710 control system

Among the advantages Potlatch Forest management and operating personnel expect to realize from the 1710 control system are:

1. Reduction of grade change time. The system provides the machine operators with easily-read information on the status of the machine. Off-normal conditions are typed in red so that required adjustments are easily noted and rapidly implemented.

2. Reduction of off-grade production. Once on-grade conditions are established, monitoring and alarming functions of the computer system quickly identify potentially dangerous changes.

3. Controlled repulping of off-grade broke. When broke is being repulped, it is desirable to control the proportion of broke added to new stock. The computer provides the proper broke ratio to be used by the operator.

4. Moisture measurement. The system provides the means to keep the water content of the paper within specifications. Apart from the obvious competitive advantages of accurate moisture control, such controls should reduce breaks and assure more continuous production from one end of the machine to the other.

5. Production increase. A machine operating log is a tool for maintaining maximum operating efficiency. The computer-provided operating guides indicate the "best performance" history of the machine. Any significant variation from optimum operating speed, etc., results in red-typed alarms which are continued until the operators manage to control the machine back to best operation.

6. Uniformity and quality-repeatability. The system's memory of optimum production conditions guarantees uniformity of quality output

Continued on page 596

FLEXIBLADE COATER

Continued from page 585

and outgoing flows serves as a measure of the coating thickness applied to the sheet.

Following each blade coater, the paper sheet passes over three 60-in. dia. drum dryers partly enclosed by a 3-D, high-velocity convection dryer which introduces a high volume of high temperature (240°F) air uniformly across the coated surface. The two 3-D, high-velocity convection dryers serving the Flexiblade coaters are designed for an air velocity of 16,000 fpm at the nozzle.

A third 3-D, high-velocity convection dryer is used to supply medium velocity air (6,000 to 8,000 fpm at the nozzle) to air-knife coated stock to provide the additional drying length and drying time required for the relatively lower solids coating applied in weights ranging from 5 to 15 lbs. per 3000 sq. ft.

Each of the three 3-D high-velocity convection air dryers is served by a steam heated 82,000 cfm capacity air heater equipped with five heating coils designed for an operating steam pressure of 125 psi.

The drying rate on the coater is controlled by a Curtiss Wright Aquatel instrument which continuously scans the entire width of the sheet ahead of the winder and records the moisture content on a chart for control within narow tolerances.

The coater is driven by a Reliance variable speed sectional electric drive.

MARKET-ORIENTED ENGINEER

Continued from page 583

derlying purpose which may be one or a combination of:

1. Maintenance of the property for reasons of safety or maintenance of production.
2. Maintenance of quality of prod-

ROLL CROWNING

D. S. DAVIS
University of Alabama

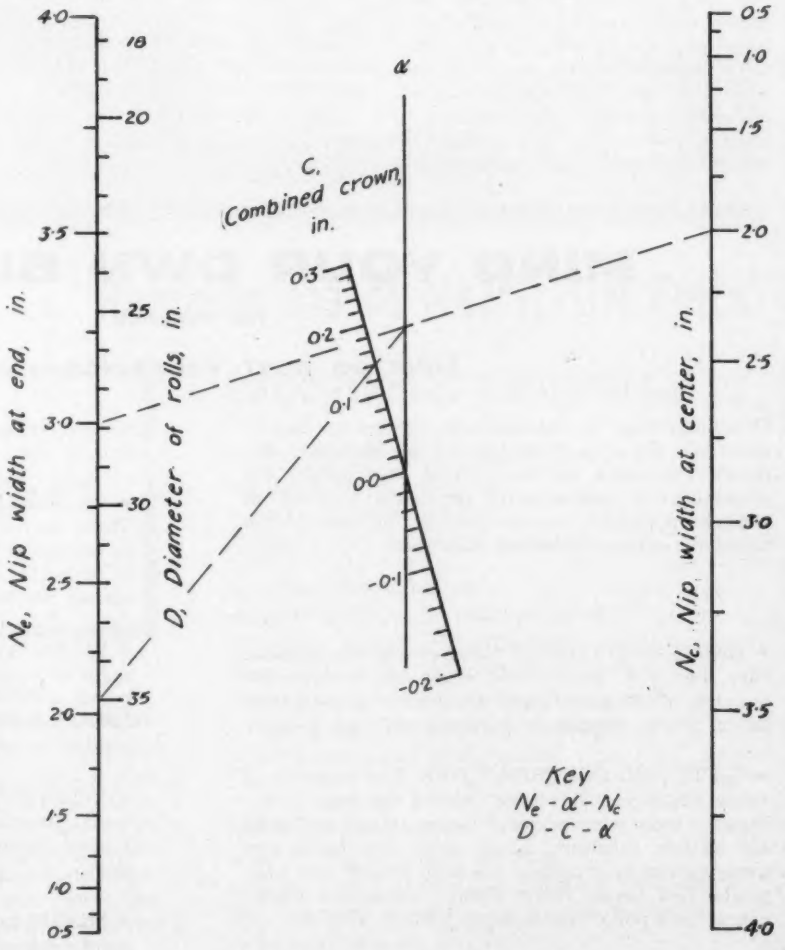
FOR TOP and bottom press rolls of the same diameter, correction of the combined crown can be determined by means of the Raybestos-Manhattan formula,

$$C = (N_e^2 - N_c^2)/D$$

where C = correction of the combined crown, inches
N_e and N_c are the nip widths at the end and center, respectively, in inches
and D = diameter of the rolls, inches.

This equation can be solved readily and accurately by means of the accompanying nomograph, which was constructed in accordance with methods (1) described previously.

The use of the chart is illustrated as follows: What is the combined crown correction when, for 35-in. rolls, the nip widths at the end and center are 3.0 and 2.0 in., respectively? Following the key, connect 3.0 on the N_e-scale and 2.0 on the N_c-scale with a straight line and mark the intersection with the α-axis. Connect this point and 35 on the D-scale with a straight line and read the combined crown correction as 0.14 in. on the C-scale.



Literature Cited .....
(1) Davis, D. S., "Nomography and Empirical Equations," (Chapter 9, Reinhold Publishing Corp., New York, 1955.

ucts.

3. Improvement of quality of products.
4. Expansion of capacity, or
5. Reduction of costs.

In planning and executing any project, engineering and technology are not, and cannot be, an end unto themselves. Their place in the picture is as one cog in the corporate scheme of things and their ultimate goal must be to enable the sales effort to successfully serve the market place against the inroads of competition. Engineering planning which ignores these ends can be serious or even disastrous to a company — as is evidenced by the bodies on the historical battlefield of American corporate life.

A better interdepartment working relationship needed

Let us take a look at sales for a moment. The successful salesman in our industry has changed completely. The glad hand, the entertainer, and the golf course devotee no longer gets the order unless he has something else to offer. In our own sales departments we endeavor no longer to hire a young salesman unless he is prepared to spend many months as an in-plant trainee, learning at least the basic rudiments of manufacturing, technology and engineering so he can understand how all of these functions contribute to a successful sales effort. Admittedly, we have a long way to go, for these programs should have been started many years ago.

To sum up, may I say that the engineer who will move back far enough from the job to see it broadly, will see it take on more significance and meaning. He will see more clearly the challenge, the obligations and the opportunities which lie ahead.

He will see the need for a closer working relationship between the engineer and people in the technical, manufacturing and sales field (even though their basic philosophies and functions may vary widely).

He will see that social contact with these other groups is not enough and that a singleness of purpose and common goal within the corporation is worth striving for.

He will see that the final success of a project rests in the degree of acceptance and use of the product or process in the market place.

And finally, he will see that a closer and well-coordinated working relationship between people in the engineering, technical, manufacturing and sales departments is essential for corporate success, and perhaps survival in this modern era of rapidly changing technology, increasing costs and aggressive competition.

IBM SYSTEM

Continued from page 594

as well as repetition of identical operating conditions for successive reorders of already processed paper grades.

7. Production reports (management by exception). For the first time, management will have a complete and detailed record of a day's production. With off-specification performance typed in red, management need be concerned only with cases of exceptional performance.

8. Research data. Future studies benefit from the production history automatically recorded by the 1710. Extensive and accurate data provide for continuing improvements in the computer program and in paper machine operation through more thorough analysis of the correlation of production conditions and results.

MIND YOUR OWN BUSINESS

TED POLLOCK

Save on next year's taxes—now!

Deadline frenzy can be expensive around tax time—especially if you overlook any of the legitimate deductions to which you are entitled. To minimize the possibility of inadvertently penalizing yourself in 1962, keep careful records through the year of the following, often-overlooked expenses:

• UNINSURED LOSSES. Many people are unaware that they can deduct from their tax returns the amounts of uninsured losses through fires, auto accidents, thefts, damage to property and bad debts.

• GIFTS AND CONTRIBUTIONS. Any property of value which you give away during the year is deductible from your personal income taxes, including old clothes, furniture, books, tools, etc. So is any money given to churches, nonprofit schools and hospitals, Red Cross, Heart Fund, Community Chest, cancer and polio, Boy Scouts, YMCA, YWCA.

• STATE AND LOCAL TAXES. Deductible, too, are the taxes you shell out to your city and state for the following items: retail purchases and gasoline, income and property, your driver's license, auto tags and, in some states, tobacco, liquor and admissions.

• PROFESSIONAL OR BUSINESS EXPENSES. These include such items as dues, initiation fees, subscriptions to professional journals, business entertainment and travel, automobile expenses incurred for business or professional purposes.

• WORK AT HOME? Even if you do so only at night or weekends, you can deduct the rent for the rooms used on a pro rata basis. Same goes for heat, lights, telephone and other costs necessary to the completion of the work.

• INTEREST PAYMENTS made on installment credit, mortgages, most loans, credit from your broker, delinquent taxes are also legitimate deductions.

• **MISCELLANEOUS.** Don't forget to deduct investment expenses . . . counseling fees . . . safe-deposit box rental . . . legal fees on tax or business problems . . . cost of preparing tax returns . . . alimony payments.

*Idea submitted by D. E. Coffelt, Southern Chemical Cotton Co., Chattanooga, Tenn.

Old Fort Henry, Kingston, Ontario, Can. — Built in 1812 Photo: Courtesy Ontario-St. Lawrence Development Commission

HAM FELTZ says: "Reminds me of HAMILTON Felts' exceptional durability!"

YOU CAN'T BEAT

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"For nearly 150 years, Old Fort Henry has withstood the relentless battering of the elements. Today, it's still in excellent condition.

"Hamilton Felts, too, stand up under the relentless pressures of modern, high-speed production. They help beat the high cost of downtime by keeping your machines running at top speed — longer . . . turning out more tonnage with less broke and imperfections.

"If one of our 300 modern, technically proven styles won't solve your specific problem, we'll be happy to design a Hamilton Felt that will. Just ask your Hamilton Felt Service Salesman — or write us today."

*WIN . . . *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each idea from a U.S. papermaker that we use wins a new 1962 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. Every U.S. papermaker *entrant* receives a famous Rex Spoon fishing lure — FREE. Send me your suggestion — today.

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Cincinnati 2, Ohio."

SHULER & BENNINGHOFEN, HAMILTON, OHIO

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General Chemical *liquid* alum is notably pure, low in insolubles and iron. Our *dry* alum is exceptionally uniform in strength, free-flowing and readily soluble.

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Warren B. Bullock

Year-end dividends — Trade agreement program unsettled

Stockholders in paper companies are sharing in the flood of increased stock-splits and increased dividends which mark the end-of-the-year directors meetings in various industries. Scott Paper Co. has split its common stock three-for-one, and increased its dividend rate by 20 cents a year. Kalamazoo Vegetable Parchment-Sutherland gave its stockholders an extra of 10 cents per share, above the current 35 cents. Christmas came early for stockholders of Papercraft Corp., maker of Christmas wrappings, with a hundred per cent stock dividend.

Rayonier added a stock dividend of 3 per cent to its year-end regular dividend of 20 cents per share. Chesapeake Corp. of Virginia voted a 2 per cent stock dividend. Certain-Teed Products Corp. voted a 25 per cent stock dividend, in addition to raising its regular dividend to 18¾ cents per share on the new stock, instead of 20 cents on the old. Nekoosa-Edwards Paper Co. voted a 10 per cent stock dividend in addition to a quarterly dividend of 20 cents per share. Brown Co. has resumed dividend payments after a long stockholders drought, a dividend of 10 cents having been voted. United Board & Carton Corp., which recently reduced its dividend rate to 10 cents per share, has restored the 25-cent rate.

Shifts in production

Two important shifts in production fields have been announced. Gilman Paper Co., long prominent in the kraft and specialty field, is entering the fine paper market, and the Southwest Forestry Industries will spend $5,000,000 in acquiring and building grocery and paper bag and container plants. At the same time, Mead Corp., which has long been in the fine paper field, is broadening its operations and will, in addition, become the distributor for groundwood printing papers made by the St. Croix Paper Co.

Gilman's entry into fine paper manufacturing will involve extensive remodeling and rebuilding of much of its Vermont equipment, but some of its coarse grades will be made at St. Marys, Ga. Harold Holden, former president of the Writing Paper Manufacturing Association, is now president of Gilman.

Southwest Forestry Industries will produce grocery bags at its pulp and paper mill in Snowflake Mills, Snowflake, Ariz., with the addition of a bag plant, and enters into box production by the acquisition of the Premier Container Corp. of Chicago.

The Mead-St. Croix venture will apply only to the production of groundwood printing papers from the latter company's rebuilt newsprint machine, and will not affect the newsprint production of the St. Croix Co.'s Bangor, Me., mill.

A consolidation of sales activities of two large Canadian companies through a combined New York office will include the newsprint and pulp production of Anglo-Newfoundland Development Co. Ltd., and Price Brothers & Co. Ltd. Northeastern Paper Sales Inc. of New York, a wholly owned subsidiary of Anglo-Newfoundland will take over Price Brothers United States activities.

Trade agreement program

The battle between President Kennedy and the protectionists who oppose the Administration plans for relaxing restrictions on foreign imports has resulted in an empty seat

LETTER TO THE EDITOR

Dear Sir:

I just happened to notice in your September 1961 issue of The PAPER INDUSTRY where Warren B. Bullock, under "Current Comments", stated on page 377 that: "Even before the Kimberly-Clark-Stevens cooperative agency was formed, C. H. Dexter & Sons of Windsor Locks, Conn., announced its successful experiments in producing a new product on its paper machines. Thus one of the oldest paper companies in the United States was among the first to make radical innovations in what might be called the fibroid field."

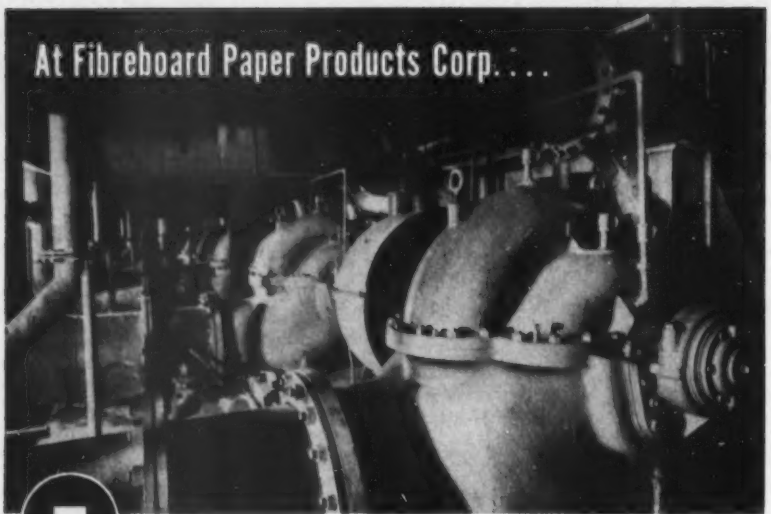
It is good that these companies be brought to the attention of your readers for the work they have done and I would be the last to try to detract from that work because it is excellent. However, I think it is important to keep the record straight and I would like to point out to you that the Riegel Paper Corporation was the first to make fibroid papers. For the record, Riegel made 100% Nylon paper on July 6, 1955, 100% Orlon paper on January 24, 1956, 100% Dacron paper on October 26, 1956 and 100% Dacron paper using the textryl fibroid on July 21, 1958.

I recall well the first Nylon paper made by Riegel when treated with Zytel resin (a nylon resin) was extremely strong. Riegel's early synthetic fiber papers were not particularly strong without secondary treatment. However, the use of the fibroid binder gave products several years roughly comparable to those made today.

I know you are as anxious as I to see that credit is given where it is due. This is particularly important with respect to original work.

Yours truly,

Ward D. Harrison
President
Allied Paper Corporation



6 CAREFULLY SELECTED Warren Fan Pumps for quality improvement program

PLANNING is the key to efficiency in any fan pump installation.

Warren application engineers, with a world of experience in *all* phases of paper/pulp pumping, help plan the most efficient type of fan pumps for installations as shown above. At the San Joaquin (California) mill of Fibreboard Paper Products Corp., there are six Warren 20-DB-22 fan pumps. Each is rated for 13,000 GPM at 39 foot head, at 555 RPM.

In addition . . .

- Shafts and bearings are designed for 24 hours-per-day duty.
- Large liquid passages permit low velocities, high efficiencies and pulseless flow.
- Impeller eye area is properly sized for low entrance velocities.
- As with all Warren Fan Pumps of this size, dual volute construction is standard.
- Parts subject to inevitable wear can be replaced economically—impeller rings, case rings and shaft sleeves.
- Ring clearances are designed to maintain high initial efficiencies.
- Top quality materials of construction are used throughout.

Warren design and application engineers overlook nothing. Conservative specific speeds and accurate head and capacity requirements are also carefully planned. And from Warren's wide range of impeller styles they select the *one* that suits the application best.

Ask for the help of a Warren application engineer . . . early in your planning. That's when true pumping economy really begins.

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WARREN PUMPS, INC.

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PP 46

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in the United States Tariff Commission which is composed normally of six members, three from each of the major parties. The Commission now has neither a chairman or a vice-chairman. The President in June appointed the Commission's chief economist, Ben D. Dorfman to the vacant spot, but the Senate Finance Committee failed to confirm the appointment before Congress adjourned. It is said that the President planned to name Mr. Dorfman to the Commission chairmanship, but the Senate protectionists wanted a Democratic protectionist, Commissioner Glenn W. Sutton, in that post. The President refused to buy this proposal, and the struggle over the nature of any changes in the Reciprocal Trade Agreement program, which expires next year, will continue into the next session of Congress.

An example of the tariff problems which confront industry is directly in the paper box field. The Administration has granted Sweden a compensatory reduction in the United States duty rate on boxes of paper, papier-mache or wood, covered or lined with paper, in return for an increase in the United States duty rate on spring clothespins, largely imported from Sweden. The duty rate on boxes, also involving imports from Sweden, was reduced from 7.4 per cent to 5.4 per cent and the rate on clothespins had been raised to 20 cents per gross from the previous 10 cents. Imports of spring clothespins have been about one quarter of a million dollars a year and paper boxes over one and a quarter million. On balance, Sweden gains materially.

Net income

St. Regis Paper Co. — For nine months ended September 30, $13,093,066; a year ago, $16,889,615.

Union Bag-Camp Corp. — For the third quarter, $3,790,383; a year ago, $4,322,073. For nine months, $12,042,544; a year ago, $14,540,073.

Masonite Corp. — Fiscal year ended August 31, $3,627,989; a year ago, $4,399,904.

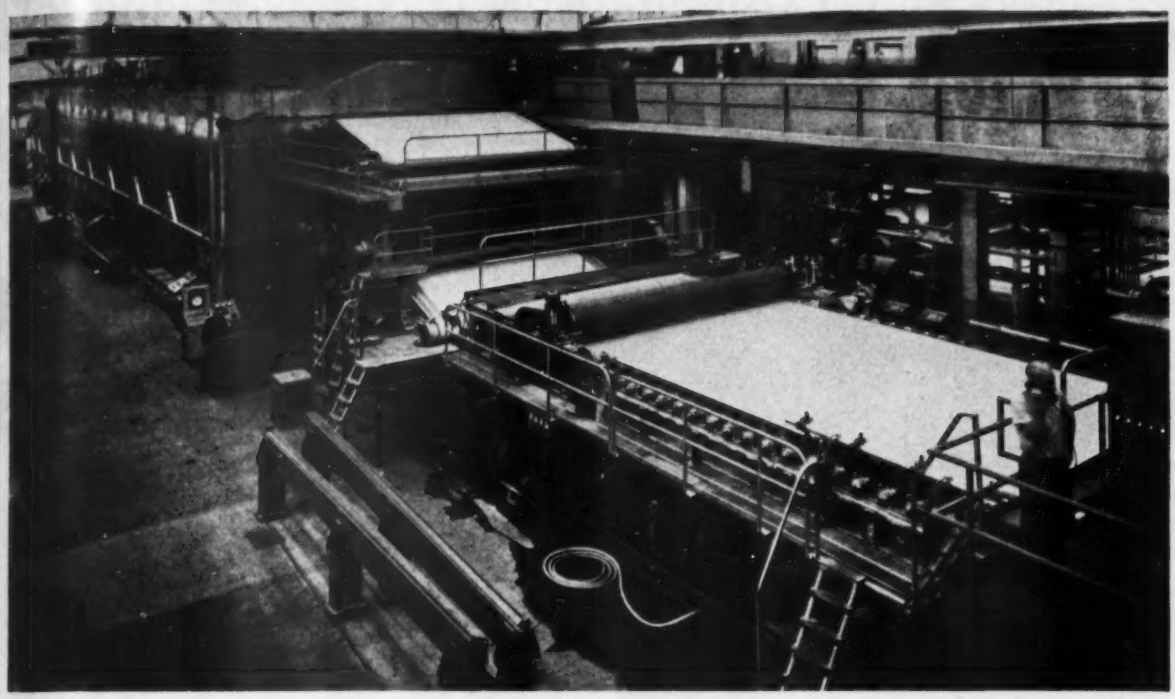
Mead Corp. — For 40 weeks ended October 1, $8,887,829; a year ago, $10,487,133.

S. D. Warren Co. — Nine months earnings, $4,933,000; a year ago, $4,069,000.

Champion Papers Inc. — For third quarter, $3,423,000; a year ago, $2,256,000; For three quarters, $7,103,000; a year ago, $5,072,000.

Great Northern Paper Co. — Income for 40 weeks to October 8, $1,912,578; a year ago, $1,909,236.

Continued on page 612



1750 Ton Prima Donna

All Fourdrinier Machines are sensitive, temperamental Prima Donnas, each one completely unalike in performance and operating characteristics.

No pea-in-a-pod similarity in these machines, or for that matter in *WISCONSIN* Fourdrinier Wires with other conventional wires . . . and for good reason. At *WWW*, specialized craftsmanship in combination with technological research results in a wire that is custom-matched to the unique characteristics of each paper making machine.

This scientific departure from the conventional Fourdrinier Wire application is the reason why users of the new, years-ahead LEV-L-WEVE* are realizing — for the first time — full, built-in machine capacity, highest quality production with longer wire life and low operating costs.

The addition of LEV-L-WEVE to *WISCONSIN'S* full line of Fourdrinier Wires now offers you the advantage of making the proper choice or selection from a complete line, backed by over 60 years of continued research dedicated to supply only the finest in Fourdrinier Wires.

Want positive proof? Call or write, today, and a *WWW* representative will tell you how to realize the same dollar savings enjoyed by many other mill operators . . . all of them enthusiastic users of *WISCONSIN* Fourdrinier Wires.

*Patent Applied For.

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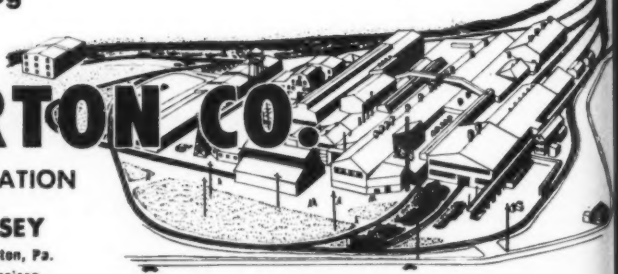
Let us analyze your operation and recommend the best alloy steel for your service, using TISCO demountable plug and liner. Write for a bulletin.



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VAULT

National Starch Achieves Further Success on Curtain Coating Techniques

National Starch & Chemical Corp. has reported new application data on the use of curtain coating techniques to apply highly functional films of polyvinylidene chloride latex on paperboard materials.

The company's recent tests have shown that continuous films of its Resyn 3600 can be achieved at low coat weights on various substrates with curtain coating equipment.

Resyn 3600 (a polyvinylidene chloride water-based system that imparts unusual barrier properties) was introduced last year and has already been applied by conventional coating techniques on paperboard products. The latex has been found to provide these products with outstanding resistance to moisture, gases and greases.

Curtain coating is a technique which allows a thin curtain of latex to be formed prior to application and gently deposited as a continuous film on substrates fed through the equipment. Coatings applied in this manner tend to set very rapidly since the pre-formed film does not cause excessive pre-wetting or penetration of the stock as is common when conventional application methods are used. The low cost of equipment for this process will attract possibilities for its use in sheet coating polyvinylidene chloride on piece work and in applying the latex to paper in web coating operations.

Courses in Automatic Control

Two special courses — "Control Dynamics" and "Fundamentals of Instrumentation" — are being offered in addition to the regular courses by Minneapolis-Honeywell Regulator Co.

Each course is limited to 15 students and is designed to include lectures, demonstrations, student participation exercises and written examinations.

The "Control Dynamics" class is a five-day session for instrument and systems engineers covering non-mathematical techniques for evaluating process dynamics in solving automatic control problems.

The "Fundamentals of Instrumentation" is a 10-day course designed primarily for engineers with little or no instrument experience and for those needing to review the principles of conventional instrumentation.

Information concerning these courses can be obtained by writing to Clarence A. Dyer, Instrumentation Education Center, Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.

Consulting Organization Formed

A group of retired paper industry executives have joined together to serve as a consulting group to the pulp and paper industry. The new organization, known as the Pulp & Paper Know-How Associates, does not propose to compete for the type of work now being done by a number of consultants, but is offering experienced and very personalized outside viewpoint on the smaller but none-the-less important problems of every-day operation.

The group offers their services in the field of management, production, sales, product engineering, development, accounting, industry mergers and many others.

Further information concerning this group is available by writing to: Pulp & Paper Know-How Associates, Box 667, Holyoke, Mass.

Pictured left to right are: E. C. Tucker, a director; P. S. Bolton, president; Helen U. Kiely, secretary-treasurer; and C. H. Kent, vice president and managing director.

Southern California District of TAPPI Organized

H. M. Annis, president of TAPPI has announced that the Los Angeles members of TAPPI have organized the Southern California District of the Golden Gate Section. The petition for district status has been approved by the TAPPI Executive Committee and the Local Section Operations Committee.

Elected officers for this group are: *Chairman* — E. Tonjes of Flintkote Co.; *Vice-chairman* — T. Pringle Jr. of Menasha Container; *Secretary* — D. T. Snell of Continental Can Co.; *Treasurer* — L. R. Giersch of Crown Zellerbach Corp.; *Membership chairman* — S. Feldman of Flintkote Co.; and *Publicity chairman* — L. L. Larson of Potlatch Forests Inc.

Research Grant Awarded to Syracuse College of Forestry

The Northeastern Forest Experiment Station, Forest Service, United States Department of Agriculture, has awarded a $12,000 research grant to the State University College of Forestry at Syracuse University.

This grant will be used to study the catalytic hydrogenation of lignin during alkaline pulping.

Project director for the three-year research program will be Dr. Conrad Schuerch Jr., professor and chairman of the Department of Forest Chemistry at the College of Forestry.

Bolton Award Books Available

John W. Bolton & Sons Inc. of Lawrence, Mass., is now distributing the books containing the ten winning essays and a composite of all papers entered in this year's 14th Bolton Award. The subject of this year's annual essay competition was: "Privileges of the Free Enterprise System".

Copies of the Bolton Award book are available without charge to interested members of all industries, schools, colleges, libraries and government agencies. Requests should be directed to Arthur G. Schwarzenberg, John W. Bolton & Sons Inc., Lawrence, Mass.

Little Giant Products To Be Manufactured Overseas

Little Giant Products Inc. of Peoria, Ill., and Oldham & Son Ltd. of Manchester, England, have concluded an agreement whereby Little Giant Lift Truck attachments will be manufactured and sold by Oldham in Western Europe and throughout the British Commonwealth of Nations, excluding Canada.

Oldham maintains offices in Manchester, England, and throughout the world. It has plants in England, France, South Africa, India and Australia. It is a leading producer of storage batteries, including batteries for fork lift trucks.

Oldham will manufacture and market the attachments under Little Giant's trademarks. The agreement also provides that the two companies shall collaborate in future research and development programs in the lift truck attachments field.

Brown Moves to N.Y.

The executive and general sales offices of Brown Co. have been moved to New York City. The offices were located at 150 Causeway St. in Boston. Location of the new headquarters is 733 Third Ave. at 46th St. The decision to move was due to increased development of the company as a national concern. Brown will still maintain a Boston sales office.

Company changes

Hamermill Paper Co. has entered into agreements with two major stockholders of **Strathmore Paper Co.** to acquire from them 42,528 shares of capital stock of Strathmore in exchange for 63,793 shares of common stock of Hammermill. Strathmore facilities include paper mills at West Springfield, Woronoco and Turners Falls, Mass.

Dennison Mfg. Co. has announced the purchase of **Eastman Tag & Label Co.**, a California corporation. The purchase involves payment in cash to Eastman stockholders which will be financed by Dennison out of earned surplus. The acquisition is expected to add about $3,500,000 to the company's annual sales and will also provide needed production facilities on the West Coast.

KVP Sutherland Paper Co. has completed arrangements for the sale of its Albany, Ga., plant to **Brunswick Corp.** Demands for KVP Sutherland products formerly filled by the Albany plant will be met largely from the Milham Road specialties plant in Kalamazoo.

Presto Adhesive Paper Co. of Miamisburg, Ohio, and **Presto Adhesive Paper Co. Inc.** of Glendale, Calif., has announced that the offer to sell a minority stock interest in the two Presto companies to **Eureka Specialty Printing Co.** of Scranton, Penn., and its wholly owned subsidiary **Pee Cee Tape & Label Co.** has been withdrawn. Both Presto companies will continue to operate as they have in the past, completely independent of any converter whatsoever.

John W. Bolton & Sons Inc. and **Emerson Mfg. Co. Division** of Lawrence, Mass., have purchased the **Sheppard Plate & Machine Works** of Atlanta, Ga., a 41-year-old manufacturer and distributor of disc refiner plates for the pulp and paper industry. As a result of this acquisition **Bolton-Emerson Southern Inc.** has been formed as a new corporation affiliated with the parent company. Operation of the new company will be continued from the same location formerly occupied by Sheppard.

Gilman Paper Co. has anounced a change in the name of the **Specialty Papers Division.** To identify more completely the grades of paper, the name will be changed to **Fine and Specialty Papers Division.** The new division will be headed by R. E. Bringman.

LaPine Scientific Co. has acquired **University Apparatus Co.** of Berkeley Calif. The Berkeley office and warehouse will serve as a third shipping location for LaPine Scientific Co.

Western Tablet & Stationery Corp. of Dayton, Ohio, has made arrangements with **Champion Papers Inc.** of Hamilton, Ohio and Montag Inc. of Atlanta, Ga. for Westab to purchase for cash the business of Montag. The managements, trademarks, products and facilities of the two companies will continue without change.

Thiokol Chemical Corp. of Bristol, Pa., has announced that it plans to acquire all of the property, inventory and business of the Trenton, N. J., industrial laminates plant of the **St. Regis Paper Co.** in exchange for about 116,000 shares of Thiokol capital stock.

The Cellu-Craft Division of Rapid-American Corp. announced that it has acquired **Bagphone Corp.** of Flushing, N.Y., a leading designer, printer and converter of film foils and papers for the packaging industry.

De Laval Separator Co. of Poughkeepsie, N. Y., has purchased **Hercules Filter Corp.** of Hawthorne, N.J., a manufacturer of pressure-leaf and asbestos sheet filters. Hercules will be operated as a division of De Laval.

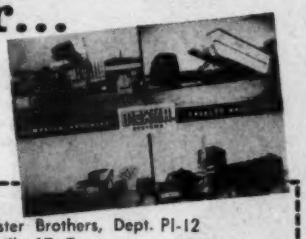
Manning, Maxwell & Moore Inc. of Stratford, Conn., and **Cooper Alloy Corp.** of Hillside, N.J., has announced that Manning has agreed to buy Cooper Alloy's valve and fittings business and related assets. The **Foundry Products Division** and the **Vanton Pump & Equipment Corp.** will continue to be operated by the Cooper Alloy Corp.

Two Cincinnati sales offices of **American Air Filter Co. Inc.**, have merged. The AAF branch office will join **Helburn Engineering** to form a single office under the latter's name. The Cincinnati Branch's sub-office in Dayton also will become a part of Helburn Engineering.

Continued on page 606

These "Super-Snoopers" Save Industry Millions of Dollars Each Year...

"Super Snoopers" are "Cost Detectives" who can help you ferret out wasted waste dollars. In reality they are Dempster-trained waste and refuse engineers who offer a free consultation and survey service to industrial plants (large or small) without obligation of any sort. These men are abreast of the latest breakthroughs in waste storage and collection and make hundreds of surveys and consultation calls each year, resulting in millions of dollars in savings. Sometimes a minor improvement, such as an inexpensive chute or conveyor, can mean thousands of dollars saved. Or, a few containers rented from a private hauler can effect big savings. There is a Dempster-trained engineer near you, and this consultation service is yours for the asking . . . so why not write today?



To: Dempster Brothers, Dept. PI-12
Knoxville 17, Tenn.

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Name _____ Title _____

Company _____

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DEMPSTER DUMPSTER

Dept. PI-12 DEMPSTER BROTHERS, Inc. Knoxville 17, Tenn.

For more data circle 116 on Post Card

recent expansions

Turcot Paperboard Begins Production

Turcot Paperboard Mills Co. of Montreal, Canada, has started production on its multi-cylinder paperboard machine — producing nine-point corrugating medium, linerboard, various grades of folding and non-folding boxboard and other special grades of paperboard.

Turcot is a newly formed division of the Kruger Organization, a Montreal-based management holding firm. Kruger has announced that the Turcot development involved a total investment of more than $8 million.

The pulp preparation system installed in a new mill is from Black-Clawson International Ltd. and consists of a continuous hydrapulper, a batch hydrapulper, screens, deckers, stock cleaning apparatus, and refining machines as well as pumps and agitators in all the chests.

A new system of stock flow to the vat is said to be the first installation of its kind on a multi-cylinder paperboard machine in Canada. The paperboard machine, also from Black-Clawson, consists of seven vats of which five are counter-flow and two are direct flow.

The dryer section, from Millspaugh (Canada) Ltd., consists of 53 cylinders 48 in. in dia. and capable of carrying a pressure of 75 lbs psi. The section is totally enclosed by an aluminum hood from Canadian Vickers Ltd., and is equipped with sliding doors for easy operation and maintenance. At the dry end are two calender stacks, a cutter and an automatic lay-boy, a Pope-type reel and a winder.

Machine drive is supplied from a line shaft through an eddy-current coupling powered by a 600-hp motor. Vats 2, 4 and 6, the suction return drum, the three primary press bottom rolls, the suction primary press top roll and the first main press top roll are driven by electric helper drives which are in turn fed from a motor generator set driven from the line shaft. Electric power is fed to the mill via two 12,000 v feeders and distributed at 2300, 550 and 115 v. The machine operates at speeds from 80 to 600 fpm and has a finished trim of 150 in.

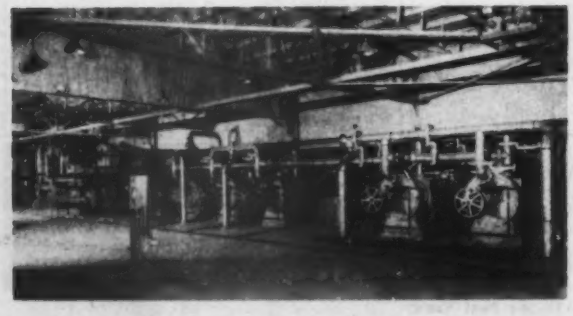
A portion of the mill's production will be utilized by several other divisions of the Kruger Organization.

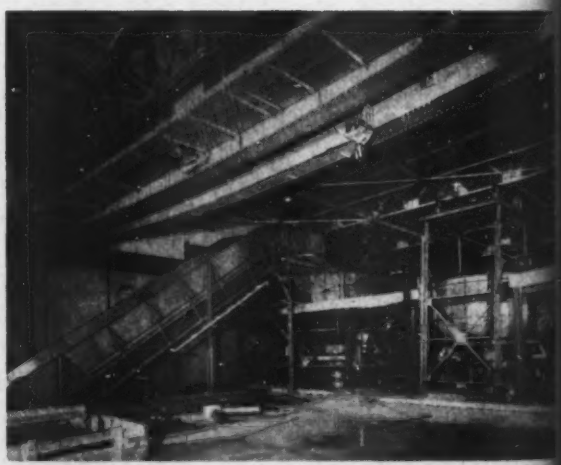
The mill has been designed to produce at a rate of 200 T/day, but present plans call for operating the machine at a production rate of 70 to 100 T/day.

Continued on page 609

Above — Hugh 53-cylinder dryer section. When completed, it will be totally enclosed by an aluminum hood equipped with sliding doors for easy operation and maintenance.

Below — View of the refining machines with the petrodifusion system at extreme left.





A bale conveyor and two hydrapulpers photographed during the final stage of construction and machinery installation.

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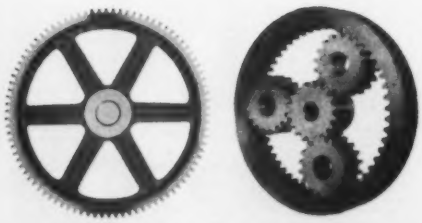

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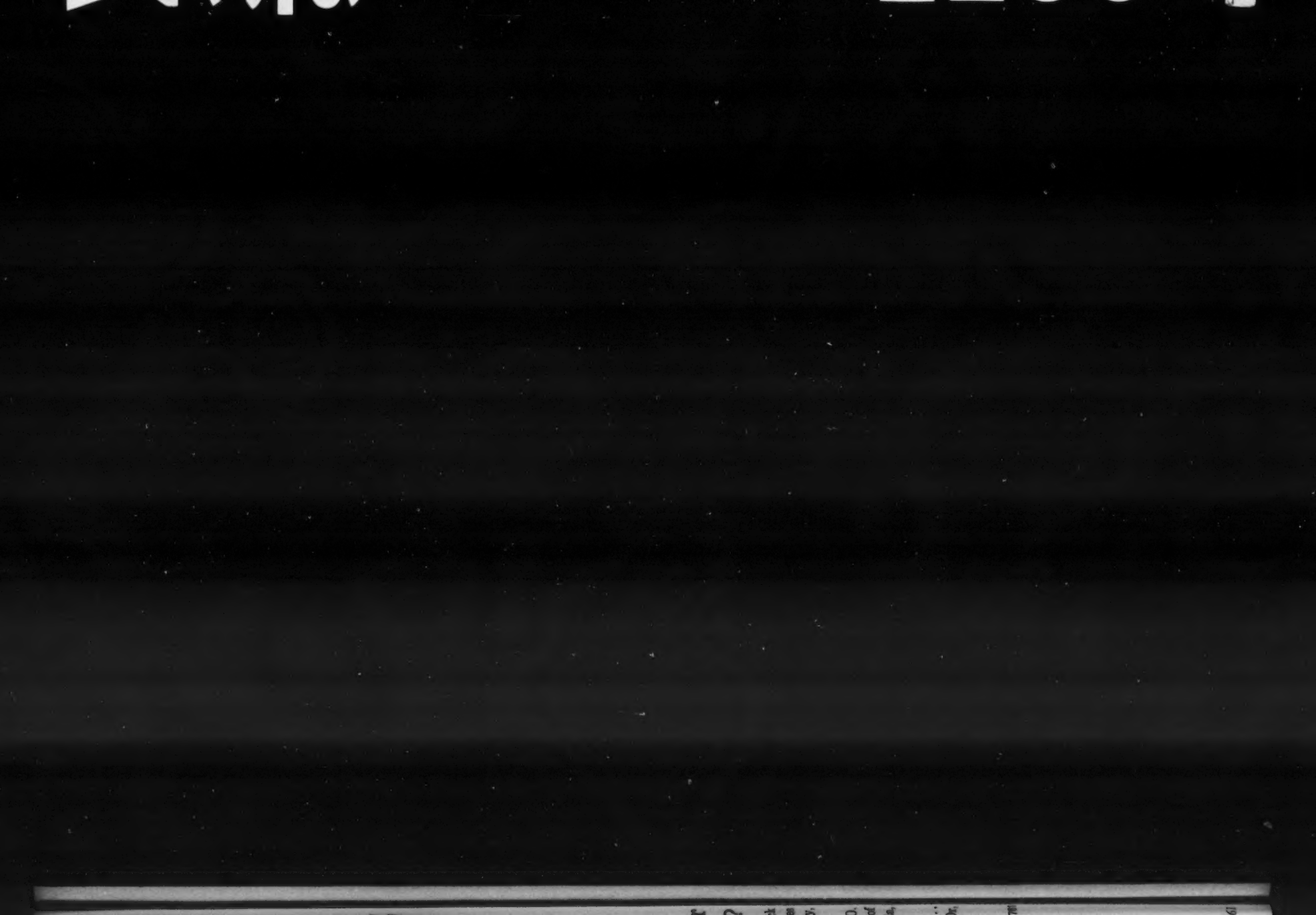


NEWS OF THE INDUSTRY

Continued from page 606

Columbia Box Board Expands Operations

The formation of a new manufacturing company for laminating, molded products and other specialties utilizing paperboard and plastics, individually and in combination, has been announced by Robert R. Howarth, president of Columbia Box Board Mills Inc., of Chatham N.Y.

The new company, Columbia Specialties Inc., will manufacture partially converted paperboard specialties. It is contemplated that additional equipment and machinery will be installed for the manufacture of molded products, die-cut products, and some patented processes. Located in Chatham, the 20,000-sq.-ft. facility is expected to begin production in January, 1962. Ralph Barber has been elected vice president of the new company and will act as general manager.

Construction Underway for Container's New Folding Carton Plant

Container Corp. of America has begun construction on its new folding carton plant located at Carol Stream, Ill., a suburb of Chicago.

The new plant will be a one-floor, 350,000-sq. ft. structure and will be used to handle the folding carton operations that were previously carried on at Container's 35th Street facility in Chicago.

In addition to the production unit, the Carol Stream facility will include a two-story, 36,000-sq. ft. office building housing the sales and administrative staff and the company's central Design Laboratory and Packaging Museum.

Operation at the Carol Stream plant is expected by the end of 1962.

Continued on page 610

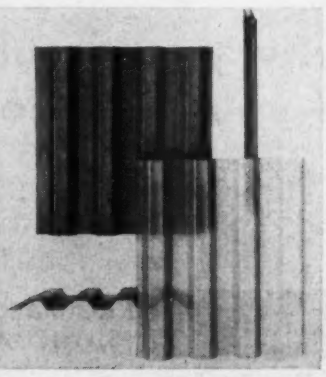
Allied Chemical Builds Plant For Vinyl Panel Production

The Barrett Division of Allied Chemical has announced it will construct the first domestic plant for commercial production of incombustible plastic building panels extruded from polyvinyl chloride resins.

The new plant will be built at Barrett's Edgewater, N. J., site and start-up is expected by early 1962. The company will produce two types of panels — opaque and translucent — and will be available in flat form and in a variety of corrugations. Basic characteristics in this paneling which makes it advantageous as a building material is the availability of the panels in virtually unlimited lengths and their non-flammability, unique factors among materials now used in similar applications.

H. Dorn Stewart, president of the Barrett Division, stated: "We have seen many exciting architectural ideas made practical through use of vinyl panels which also are unusually lightweight, resistant to moisture and corrosive chemicals. . . . . application of the new Barrett vinyl building panels to industrial, chemical and commercial and residential construction is anticipated by the company".

Technical data on this new paneling can be obtained by writing to: Product News Section, Barrett Division, Allied Chemical Corp., 75 West St., New York 6, N. Y.



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NEWS OF THE INDUSTRY

Continued from page 609

Kruger Organization Incorporates New Company

The Kruger Organization Ltd. of Montreal has announced the organization of a new company — Papeles Nacionales, S.A. Construction is now underway for a new $5-million mill for the company to be built in Colombia, South America. It is said that it will be the largest of its type in Colombia. The 160,000-sq.-ft. plant will be completed near the end of 1961.

Mill machinery and equipment is already in Colombia, ready for installation. It will be equipped initially with one paper machine, pulp preparation, finishing and converting equipment. It will initially produce some 45 tons of wrapping and sanitary papers a day in products such as toilet paper, towelling, napkins and lightweight wraps. The output will go exclusively to the Colombian market. Pulp imported from Canada as well as local material will be used.

Head office of the new company will be located in Pereia (Caldas).

Kalamazoo Glazed Tile Tanks

Designed for the Paper Industry

1 LONG, USEFUL LIFE
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6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

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Coming Events

TAPPI

February 18-22, 1962 — 47th Annual Meeting, Hotel Commodore, New York, N.Y.

PIMA

January 11, 1962 — Connecticut Valley Division, Publick House, Sturbridge, Mass.

January 18, 1962 — Michigan Division (Annual Papermakers Get-Together), Hotel Harris, Kalamazoo, Mich.

February 8, 1962 — Michigan Division, Hotel Harris, Kalamazoo, Mich.

February 9, 1962 — Container Corp. of America, Royal Container Corp., Santa Clara, Cal.

March 15, 1962 — Michigan Division, Inman's Restaurant, Galesburg, Mich.

March 27, 1962 — Miami Valley Division, Manchester Hotel, Middleton, Ohio.

April 6, 1962 — Southwestern Division, Crown-Zellerbach Corp., Antioch, Cal.

April 24, 1962 — Miami Valley Division, Manchester Hotel, Middleton, Ohio.

April 26-28, 1962 — Pennsylvania-New Jersey-Delaware Division, Cherry Hill Inn, Haddonfield, N. J.

April 28, 1962 — Michigan Division (Annual Ladies' Night), Hotel Harris, Kalamazoo, Mich.

OTHER MEETINGS

January 22-25, 1962 — National Plant Engineering & Maintenance Show, Convention Hall, Philadelphia, Pa.

January 23-26, 1962 — Annual Meeting of the Technical Section, Canadian Pulp & Paper Assoc., Queen Elizabeth Hotel, Montreal, Que.

March 13-14, 1962 — Second Symposium on Packaging of Chemical Products, Chase-Park Plaza Hotels, St. Louis, Mo.

March 24-27 — The 49th Annual Convention of the National Association of Secondary Material Industries, Edgewater Beach Hotel, Chicago, Ill.

April 9-10, 1962 — 4th National Chemical & Petroleum Instrumentation Symposium, Wilmington, Del.

April 16, 1962 — Annual luncheon of the NPTA Inc., Waldorf-Astoria, New York, N. Y.

April 25-29, 1962 — Western Space Age Industries & Engineering Exposition, San Francisco, Cal.

April 26-27, 1962 — 3rd National Pulp & Paper Instrumentation Symposium, Jacksonville, Fla.

April 30- May 2, 1962 — 8th National Symposium on Instrumental Methods of Analysis, Daniel Boone Hotel, Charleston, W. Va.

May 5-18, 1962 — International Fair Print & Paper in Europe, D R U P A 1962, Dusseldorf.

May 6-9, 1962 — 5th National Power Instrumentation Symposium, Hotel Texas, Fort Worth, Texas

June 12-13, 1962 — Second Waste Paper Symposium, The Waldorf-Astoria, New York, N. Y.

June 27-29, 1962 — 3rd Joint Automatic Control Conference, New York University, New York, N. Y.

July 17-19, 1962 — Western Packaging Exposition, Brooks Hall, San Francisco, Cal.

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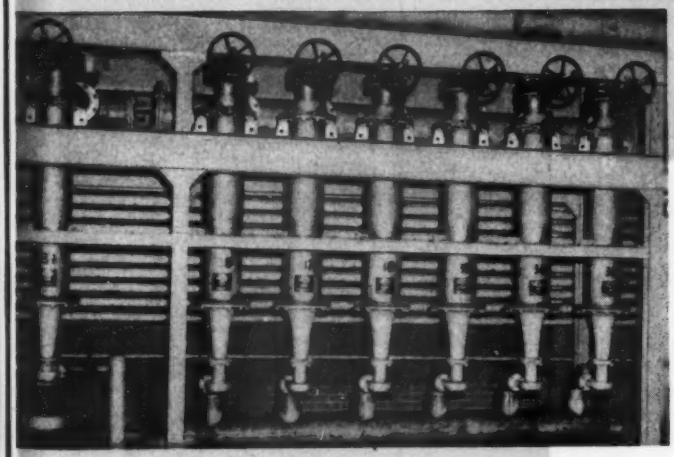

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CURRENT COMMENTS

Continued from page 600

Keyes Fiber Co. — Nine months income, $1,381,571; a year ago, $1,615,609.

Sealright-Oswego Falls Co. — For nine months, $1,733,093; a year ago, $1,294,384.

National Vulcanized Fibre Co. — For nine months, $493,000; a year ago, $1,910,000.

Standard Packaging Corp. — For 40 weeks ended October 8, $2,884,142; a year ago, $3,631,283.

Oxford Paper Co. — For third quarter, $855,000; a year ago, $477,000; nine months net was $2,438,000; a year ago, $2,133,000.

Riegel Paper Corp. — For the third quarter, $741,968; a year ago, $629,442.

P.H. Glatfelter Co. — Nine months, $1,560,228; a year ago, $1,669,701.

Packaging Corp. of America — Third Quarter, $1,638,562; a year ago, $1,269,030.

St. Croix Paper Co. — Nine months income, $887,615; a year ago, $1,129,568.

Puget Sound Pulp & Timber Co. — For the September quarter, $1,089,212; a year ago, $1,134,225.

Minnesota & Ontario Paper Co. — Nine months income, $2,646,680; a year ago, $4,717,095.

Fibreboard Paper Products Co. — months income, $1,887,140; a year ago, $1,839,229.

KVP-Sutherland Paper Co. — Year net to September 30, $5,235,749; a year ago, $5,477,516.

American Writing Paper Co. — For nine months, $450,923; a year ago, $454,538.

Fitchburg Paper Co. — For the September quarter, $143,146; a year ago, $99,205.

Federal Paper Board Co. — For 36 weeks to September 8, $2,100,000; a year ago, $2,548,000.

Hammermill Paper Co. — For 36 weeks to September 14, $1,484,836; a year ago, $2,432, 328.

Stock and Bond Quotations

New York Stock Exchange

Closing Prices	November 10, 1961	October 10, 1961
American Can	45⅜	44¾
Same Pref	36¼	38⅞
Celotex	27⅜	25⅞
Same Pref	18½	*18-19¼
Certain-Teed	73½	69⅜
Champion Papers	38¼	37½
Same Pref	93	92
Chesapeake of Va.	41½	40¼
Container	25½	25½
Same Pref	*92-95	*89½-91½
Continental Can	47⅛	43
Same Pref	*83-86	*82-82½
Crown Zellerbach	63	61½
Same Pref	*91¾-92	92
Diamond National	49⅛	47½
Same Pref	*22-22½	21⅞
Federal Paperboard	40⅛	41½
Same Pref	*22⅝-22⅞	*22¼-22¾
Fibre Paperboard	30⅛	29⅜
Georgia Pacific	58	59⅞
Great Northern	6	60¼
Hammermill	35¼	33¾
International	35¾	37⅞
Same Pref	95⅛	*94½-95½
Kimberly-Clark	82	80⅞
KVP Sutherland	38¼	36½
McAndrews & Forbes	*33¾-34	32¼
Masonite	29⅛	28
Mead Corp.	47¼	48¼
Same Pref	*92½-93½	91½
Minn & Ont	27	28¾
Nat Vulc Fib	19⅛	20¼
Oxford Paper	36¾	30⅛
Same Pref	94	93¼
Packaging Corp.	21⅜	—
Rayonier	23	22⅝
Riegel Paper	30¼	30⅜
St. Regis	38½	39½
Same Pref	*98½-99½	*97-99½
Scott Paper	124	126½
Same $4 Pref	91	91½
Same $3.40 Pref	*77-77½	*75-76½
Sealright	48⅜	46⅝
Standard Packaging	21⅜	20
Same $1.60 Pref	62	*55-65
Same $1.20 Pref	27½	26¼
Same 6% Pref	29½	27¼
Union Bag-Camp	39¼	40⅛
United Bd. & Cart	27⅞	22
U. S. Gypsum	105	99½
Same Pref	158½	157½
West Va. P&P	35⅝	36¼
Same Pref	97½	*96-97

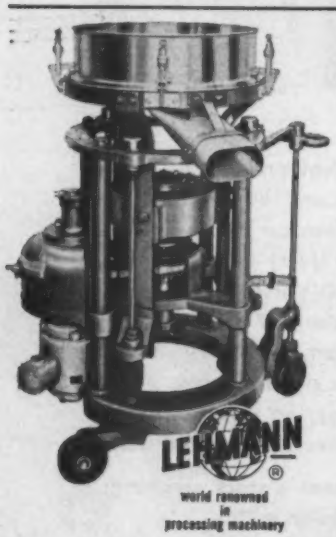
New York Stock Exchange — Bonds

Champion Paper 4¼%	13½	108
Champion Paper 3¼%	95½	95½
Champion Paper 3¾%	89	82½
Diamond Gardner 4%	93	—
Kimberly-Clark 4¼%	102¾	102¼
Kimberly-Clark 3¾%	92½	92⅛
Oxford Paper 4¾%	115	107
Scott Paper 3%	160⅛	163

American Stock Exchange

Allied Paper	16⅜	15⅞
American Writing	33⅛	33½
Brown Co.	14½	13⅜
Puget Sound	21½	22

*Closing Bid and Asked Prices



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Harry Holland & Son, Inc., 10600 Puritan Avenue, Detroit 38, Michigan
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Wm. B. Sandford, Inc., 601 West 26th Street, New York, New York
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NAMES IN THE NEWS

Swedish King appoints Professor to high post

The State University College of Forestry at Syracuse University was singled out for worldwide recognition by having a member of its faculty and research staff appointed to a high educational post in Sweden.

The King of Sweden, Gustaf Adolf VI, upon recommendation of the board of trustees of The Royal Institute of Technology, Stockholm (Sweden), and by action of the Swedish Cabinet, has appointed Dr. Bengt G. Ranby to two newly created positions — professor of polymer technology and chairman of the Department of Polymer Technology, at The Royal Institute of Technology.

Dr. Ranby was professor of pulp and paper technology and director of The Empire State Paper Research Institute at the Syracuse Forestry College.

Dr. Bengt Leopold has been named to succeed Dr. Ranby in these capacities. Dr. Leopold has published over 25 scientific papers and is co-author of 10 different patents. He has three degrees and formerly directed basic research for Mead Corp. on fibers, pulping, bleaching analysis and polymers.

F. W. Braun Retires

Employees Mutuals of Wausau has announced the retirement of Fred W. Braun, vice president, effective Dec. 1.

Braun, with the firm for 46 years, has received several awards, and has increased the public awareness of safety essentials as an author and speaker. He has been a member of the executive committee, Pulp and Paper and Wood Products Sections; and also chairman of the Pulp and Paper Section Statistical Committee.

Lamb-Grays Harbor Co. Inc.

It has been announced that Richard Markwith and William H. Mehaffey have recently joined the sales engineering staff of the company.

Owens-Illinois

Ray H. Mulford has been elected president of the company. He succeeds Carl R. Megowen, who was elected vice chairman of the board and chairman of the executive committee. Megowen has been president of the firm since 1950. Mulford, former executive vice president, has 28 years of service with the company.

DALLEY

MULFORD

Colgar Ltd.

Owen T. Dalley, former technical superintendent of the company, has recently been appointed general superintendent of the Pulp Mill Division.

Penick & Ford Ltd.

The appointment of R. L. Post as paper mill representative for the company's Corn Refining Division has been announced. He will service paper mills, bag plants and corrugating plants in the Pacific Northwest.

North Carolina State College

Dr. Eric Louis Ellwood, a native of Melbourne, Australia, was named professor and head of the Department of Wood Products in the School of Forestry at North Carolina State College. In his new position, Dr. Ellwood is responsible for the Forestry School's undergraduate curricula in pulp and paper and wood technology and all graduate programs in wood products. In addition, he is director of the Wood Products Laboratory and is responsible for the college's research in wood and paper.

Continental Can Co. of Canada Ltd.

A. G. Schumaker, manager of the Toronto mill of the company, has been appointed manager of production engineering — mill operations. Schumaker will supervise product process equipment developments of the company's three paperboard mills.

JONES

STEPHENSON

Champion Paper & Fibre Co.

Robert D. Stephenson has been promoted to manager of the Ohio division. Stephenson, also a vice president of the national Paper Industry Management Association, succeeds Earl C. Jones, who will continue to serve the division in a consulting capacity.

Gordon Gray has been named a member of the board of directors of Champion Papers Inc. Gray has the unique distinction of serving in key positions in the Truman, Eisenhower and Kennedy administrations.

Three men were selected for key management positions at Mid-West-Pak Corp., Belvidere, Ill., a subsidiary of the company. David T. McLaughlin was elected president and director; Robert A. Claridge was named production manager and Joseph E. Giordano, general sales manager.

Minneapolis-Honeywell Regulator Co.

Alonzo R. Parsons, former sales engineer for Minneapolis-Honeywell, has been appointed sales supervisor for scientific products in their Eastern regional division.

Consolidated Water Power & Paper Co.

Donald G. Pryor, former process engineer in the division's technical department, has been named to the new position of Quality Control Supervisor at the Biron Division.

David A. Larsen, who has been serving as foreman of the semi-chemical plant, has been appointed sulfite superintendent at the Wisconsin Rapids Division.

Clarence Kobishop has been promoted to the new position of assistant paper machine superintendent at the Wisconsin River Division. William Crueger succeeds him as paper machine tour foreman.

William Zurovitch has joined the Research & Development Staff. He will work in the papermaking section of the division.

Joseph H. Quell will retire at the end of October. He has been a foreman at the Appleton Division.

Owens-Illinois

Eli Fradkin, production manager at Long Island City, N.Y., has been appointed production manager at Bristol, Pa., for the Paper Products Division of the company.

William H. Forrester, plant superintendent at Long Island City, succeeds Franklin, as production manager.

John H. Reeves succeeds Forrester as plant superintendent at Long Island City.

J. O. Ross Engineering

Gordon Stephens has been appointed paper mill sales manager of the New York district office. Stephens will coordinate and supervise the sales force there. This office covers most of the mills in the Atlantic Coast region.

George F. Schuning was named general sales manager assuming the management responsibilities of the eight Ross sales offices.

American Forest Products Industries

Samuel Trask Dana, dean emeritus of the University of Michigan's School of Natural Resources, has received an award for "distinguished service to American forestry and the forest industries."

Dana, who has had a distinguished career with the U.S. Forest Service, is best known for his contributions to education in the natural resources field.

He is a Fellow of the Society of American Foresters, and has served as director and vice president of the American Forestry Association.

James D. Bronson, Yakima, Wash., an official of the Boise Cascade Corp., has been elected president of the association.

W. R. Adams of St. Regis Paper Co., New York, and J. L. Camp Jr., of Union Bag-Camp Paper Corp., Franklin, Va., were elected vice presidents. D. B. Frampton of D. B. Frampton & Co., Columbus, Ohio, was re-elected treasurer.

Longview Fibre Co.

Fred J. Sandoz has been appointed chief forester for the firm. In his new position Sandoz will report to W. Lee Robinson, manager, timber department.

Mead Corp.

James F. Stevenson, Lynchburg, Va. division manager since 1957, will be responsible for the development of new grades of products for the paperboard division. Initially, this will encompass Lynchburg and the secondary fibre mills.

Donald G. Estebo, division production manager, will become acting division manager and will be responsible for the over-all operation of the Lynchburg mill.

Black-Clawson Co.

Edward J. Kuhn has been appointed sales engineer in the Air Systems Division in Hamilton, Ohio.

Bruce Otis, assistant to the president, was made responsible for the administrative functioning of the company's international operations. He will maintain headquarters in the corporate office, New York.

Diamond Hoosier Containers Inc.

Lewis R. Powell has been promoted to manufacturing manager of the company, a subsidiary of Diamond National Corp. He will have responsibility for manufacturing operations at the company's plants in New Castle and Dayton, Ohio.

Weyerhaeuser Co.

Recent expansion of facilities in the company's shipping container division has caused a regional realignment of manufacturing responsibilities. R. H. Bowers has been appointed manufacturing manager of the eastern region. He will also continue as Delair plant manager. Harry F. Martin, becomes manufacturing manager of the western region. Carl A. Schmidt Jr. has been appointed plant manager of Cedar Rapids shipping container plant. Joe V. Baughman has been promoted to resident manager of the Yakima plant.

William L. Bush will assume the duties of director of transportation for the company.

C. W. Cochran has been transferred to the firm's Florence, Ala., branch, as sales manager.

George W. Elliot Jr. will replace Cochran as sales manager at the Charlotte, N.C. branch.

Bill G. Tarleton has been named plant manager at Florence.

W. G. Karran has been appointed resident manager at the Florence plant.

Container Corp. of America

Clifford L. Butler has been appointed general manager of the Memphis shipping container plant of the Container Corp. of America. Butler has been with the company since 1956.

James A. Figg, Jr., has been appointed general manager of the shipping container plant in New Brunswick, N.J.

Ralph E. White will retire December 31 as vice president of the corporation after 38 years of service. Until his retirement, White will continue as division vice president in charge of the company's shipping container operations at Cincinnati, Ohio, and Anderson, Indiana.

Macon M. Dalton, former general manager of the Philadelphia plant, has been appointed district general manager of the Philadelphia and New Brunswick, N.J., plants.

Conoflow Corp.

C. A. "Chuck" Jurries has been appointed district manager for the company's new Chicago sales office. The new office is located at 4500 West 31st Street, Chicago 23, Ill.

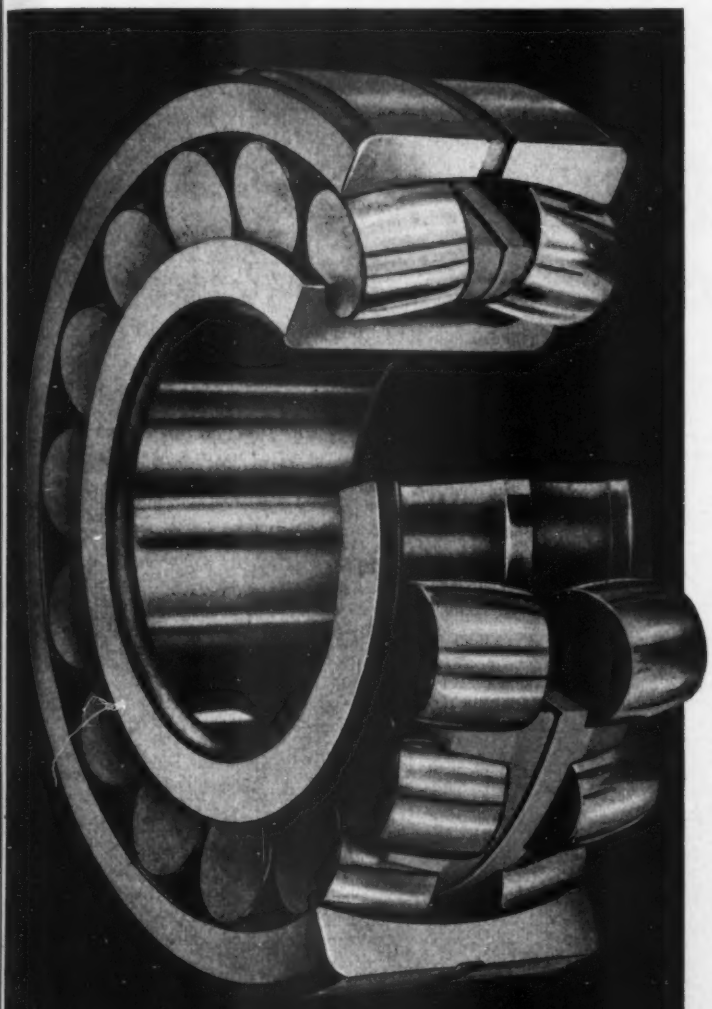
Babcock & Wilcox Co.

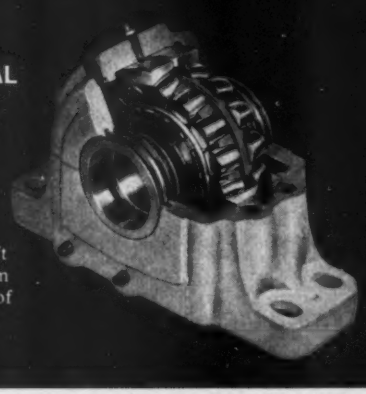
A. D. Fentzke has been appointed product manager, technical sales, of the company's Refractories Division in Augusta, Ga. He formerly was assistant laboratory manager of the Division's technical department.

Necrology appears on page 616.

LINK-BELT SPHERICAL ROLLER BEARINGS:

measure these design values in terms of your applications





LINK-BELT SPHERICAL ROLLER BEARING PILLOW BLOCKS

Made with sturdy gray iron or super-rugged cast-steel housings. Adapter mounting types for shafts from 1 7/16" to 10½" and direct-shaft mounting types for shafts from 1.7717" to 11.0236". Choice of rugged steel, multi-labyrinth or Dacron-contact seals.

GREATER CAPACITY!

The reason? *More rollers, larger rollers!* Bearing capacity depends primarily on effective roller Length, roller Diameter and Number of rollers (L x D x N). And Link-Belt offers the *largest effective roller complement* for all sizes of spherical roller bearings . . . rated according to accepted formulas of the Anti-Friction Bearing Manufacturers Association. This increase in LDN values provides extremely high capacity . . . and in users' evaluation, it adds up to far longer bearing life.

GREATER DURABILITY!

With balanced proportion design, Link-Belt spherical roller bearings possess durability characteristics that exceed the bearing industry's exacting requirements. Optimum balance of rollers, inner and outer rings must be obtained for increased bearing capacity . . . yet overall bearing dimensions must conform to an established international standard boundary plan.

Wrap-around, completely contoured retainers also contribute to durability through positive roller guidance and spacing. Precision-machined of centrifugally cast bronze, these husky retainers are far stronger than stampings or sand castings.

GREATER PRECISION!

Link-Belt spherical roller bearings are made in the world's most modern bearing plant . . . with the most-advanced tools and techniques known to industry. A rigid quality control program leaves *nothing* to chance. Each Link-Belt bearing is subjected to *758 actual inspections*. Microsmoothness and precision are continuously scrutinized by automatic machines. Result: these bearings have been specified by leading manufacturers of cranes, shovels, graders, vibrating screens, and steel mill, paper mill and foundry equipment . . . and for high-precision applications such as embossing rolls, printing presses and torque converters.

SEE BOOK 2760 for further precision, durability and high-capacity features. Contact your nearest Link-Belt office or authorized stock-carrying distributor. Look under BEARINGS in the Yellow Pages of your phone book.

LINK-BELT

SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs; Switzerland, Geneva. Representatives Throughout the World. 15,691

For more data circle 124 on Post Card

NECROLOGY

Weimer Cross

Weimer Cross, vice president and a director of the Bowater Paper Co., died in New York Hospital on October 25, at the age of 60.

Cross, who joined the company in 1940, was also chairman of Bowater Paper Co. Ltd., Johannesburg, South Africa, and Bowater Sales Co. Ltd., London. He made his home in London and was here on an extended business trip at the time of his death.

Herbert A. Kidd

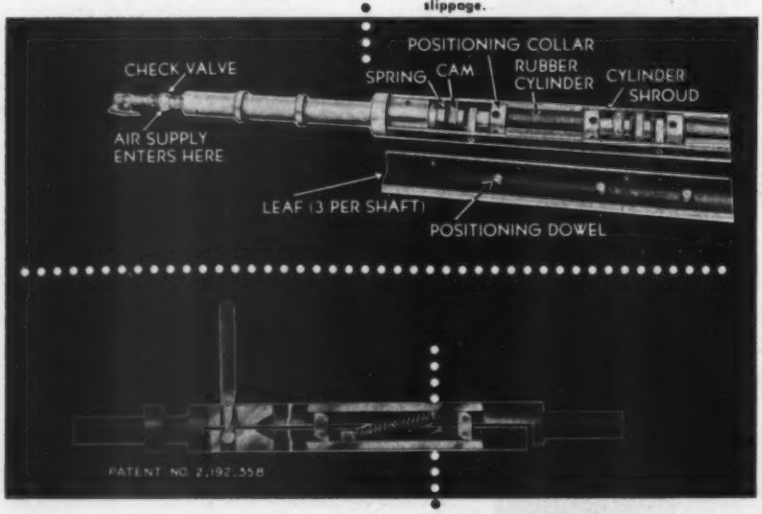
Herbert A. Kidd, 66, vice president and general manager of the Georgia Kraft Co. at Macon and Rome, Ga., died on October 15. He was associated with the Mead Corp. of Dayton, Ohio, from 1929 until 1960.

STEP UP PRODUCTION—*Safely without damage to paper*

Murco - Collard SHAFTS

PNEUMATIC COLLAPSIBLE WINDER AND UNWINDER

Wind paper without chucks, mandrels, collars, wedges or keys or other accessories normally used for these operations. Simple rugged construction . . . few parts subject to wear. Shaft expands instantly by applying air. Shaft collapses instantly upon release of air . . . no loss . . . no damage to paper or cores. Leaves expand instantly to a true circle that provides complete contact with cores or paper throughout entire shaft length . . . no slippage.



CANNOT COLLAPSE WHILE WINDING . . . ABSOLUTELY FOOLPROOF. Can be used for both winding and unwinding paper. Milled out of light metals, MURCO Windershafts are adaptable for drum winding and slitters . . . will wind hard uniform rolls without distorting cores . . . easy to operate . . . speeds assembly of cores and reduces work fatigue . . . made to your machine specifications.

MURCO WINDERSHAFTS

FOR QUOTATIONS WRITE and send us your specifications for windershaft requirements . . . quotations without obligation.

D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1883 WAUSAU, WISCONSIN

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David P. O'Conner

David P. O'Conner, a vice president and a director of Penick & Ford Ltd., died on November 11 in Roosevelt Hospital, N.Y., following a brief illness.

O'Conner joined Penick & Ford in 1913 and was made eastern sales manager for package goods a few years later. He held this position to the time when Penick & Ford bought the Douglas Starch Co. and entered the corn refining business. In 1927, O'Conner became general sales manager of the Corn Refining Division and was made a vice president of the company.

Throughout his career, he was honored on numerous occasions at testimonial dinners and was a familiar figure at industry conventions and a public servant within the industries which Penick & Ford serves. His son, William B. O'Conner, is associated with the Robert Gair Division of Continental Can Co. in Buffalo.

Theodore W. Dunn

Theodore W. Dunn, 89, passed away on October 18 in Port Huron Hospital. He was president of the Dunn Paper Co. which he founded in 1924. Dunn, at the age of 16, began his career as a laborer at the Detroit Sulphite & Paper Co. and was vice president of the mill when he resigned to start his own company.

George C. Dunn succeeded his father as president of the company.

David R. Schaffer

David R. Schaffer, a paper products manufacturer, died on October 23 at the age of 50. He was the founder and president of the Quaker Waxed Products Corp., the Gift Wrap Corp. of America, the Quaker Foil Products Corp. and the Herkimer Pulp & Packaging Corp. He also was the founder and secretary of the Sterling Paper Co.

William J. Eilerman

William J. Eilerman, divisional sales manager for Derby Sealers, a division of Minnesota Mining & Mfg. Co., died October 9 at the age of 45. Eilerman, well known in the packaging, paper and material handling fields, joined the company in 1956 as sales manager. He later was appointed vice president in charge of sales and continued in that position until the acquisition of the firm by the 3M Co. when he was named divisional sales manager.

Matched
STEEL ROLL
EMBOSSER

This new development from Paper Converting is available as a *separate installation* or *an attachment to rewinders, folders* or *printing presses,* and features —

- Matched steel rolls for long life and low maintenance — no "run-in" time required.
- Air loading with adjustable precision nip control
- Fully enclosed oil lubricated herringbone gears
- Tapered inner race spherical roller bearings arranged for hydraulic removal
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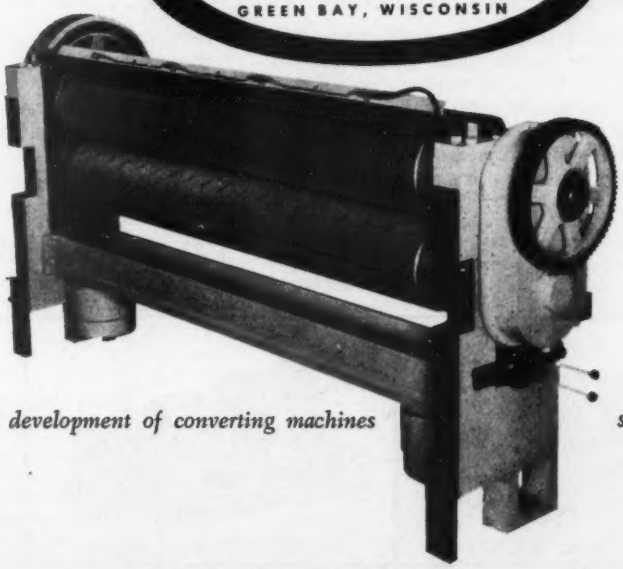
WANT TO KNOW MORE? Please write or call and we'll send you complete information and specifications.

FOLDERS, REWINDERS, EMBOSSERS, NAPKIN AND CORE MACHINES, LETTERPRESS AND FLEXOGRAPHIC PRESSES, SPECIAL CONVERTING MACHINERY.

PC MC

Paper Converting
MACHINE COMPANY
GREEN BAY, WISCONSIN

Model ME-60



creative engineering and development of converting machines *since 1919*

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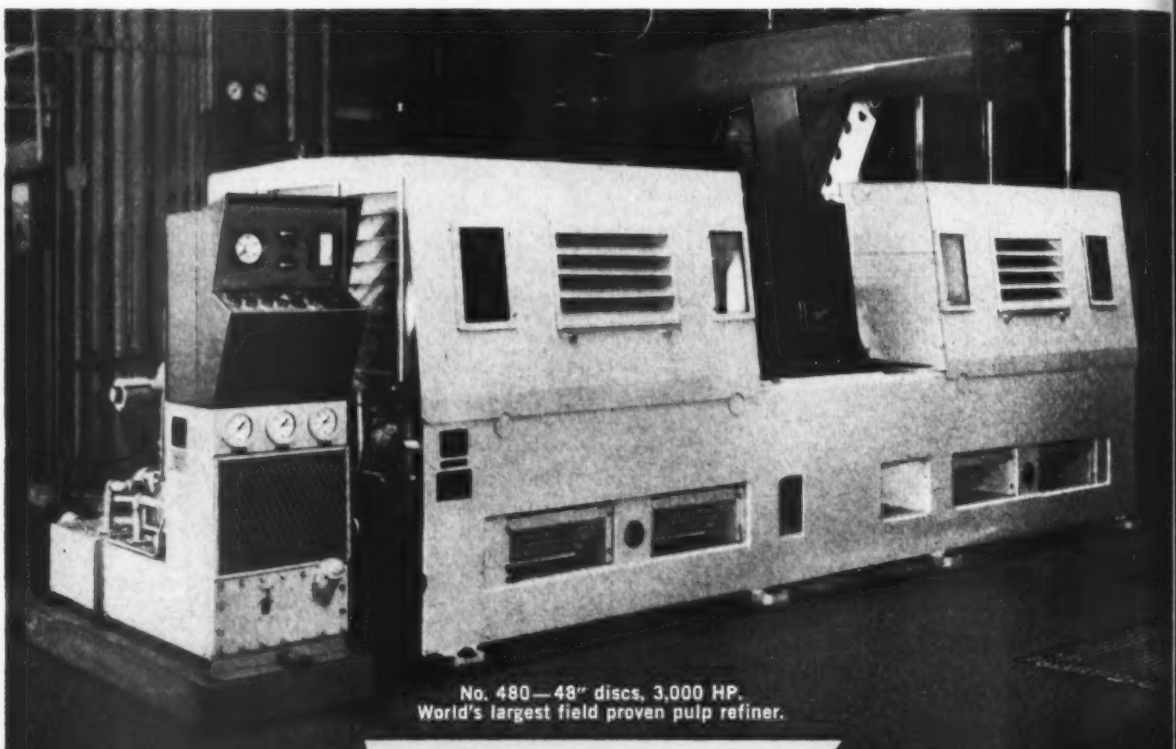
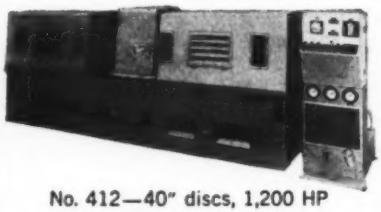


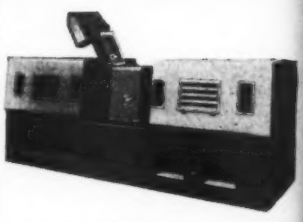
No. 480—48″ discs, 3,000 HP.
World's largest field proven pulp refiner.

NEW FOR '62!

No. 414—44″ discs
2,000 HP



No. 412—40″ discs, 1,200 HP
(shown without feeder)



No. 401—36″ discs, 600 HP
(shown without control unit)

Bauer

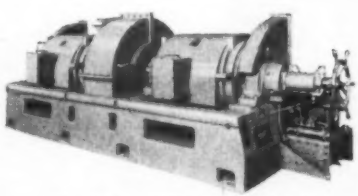
Double Revolving Disc Refiners...*In the size you want!*

With four brand new models of the field proven 480 type now added to the lineup, Bauer offers the most complete selection of double revolving disc refiners to help solve your particular pulp preparation problem. Machines are available with power ratings from 200 HP to 3,000 HP, with disc sizes from 24″ to 48″. The unique double revolving disc action of these refiners preserves, rather than shortens, fiber length, thus developing fiber strength and pliability. These refiners are widely used for groundwood, kraft and sulphite screenings; semi-chemical pulp; Bauerite pulps; sulphite pulp and paper refining (for tissues, etc.); straw, bagasse; high yield sulphite; waste paper and de-ink; and bleaching.

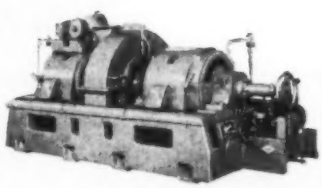
Ask for the new descriptive bulletin.

THE BAUER BROS. CO., Springfield, Ohio

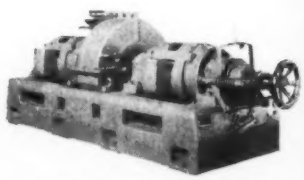
In Canada: The Bauer Bros. Co. (Canada) Ltd., Brantford, Ontario



No. 411—40″ discs, 800 HP



No. 400—36″ discs, 400 HP



No. 415—24″ discs, 200 HP

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Preservation of groundwood pulp

This paper gives the results of a fundamental study of the sorption conditions and the ion exchange properties of spruce groundwood, with special reference to the fungicide, phenylmercuric acetate (PMA), and to the phenylmercuric ion (PM). PMA was used because of its important industrial use in impregnating wet mechanical spruce pulps. In most instances the ion exchange conditions were studied by using radioactive PMA. The PM ions are evidently bound to the carboxyl groups in the pulp. Besides this ionic bond, there is also a physical absorption of the PMA. Determinations were made of the carboxyl groups both in groundwood and in other pulps.

The influence of cations and anions on PMA retention (or elution) was also investigated. It was shown that metal ions were unable to displace PM ions from groundwood, unless the pH dropped below 4.2. Below this point, PMA retention was greatly diminished, however, presumably, due to the low dissociation of the carboxyl groups, and in certain cases most of the PMA could be removed by elution with a salt solution having a lower pH. Quaternary ammonium ions containing at least one phenyl group and/or a long aliphatic group did replace PM ions. This was not the case for solutions of such quaternary salts as tetramethylammonium nitrate, which eluted very little PMA. Halogen ions, when added to a groundwood suspension, together with PMA, had a pronounced effect of decreasing PMA retention. The iodine ion had a greater effect than did the bromine ion, which in turn had a greater effect than the chlorine ion. It was also found that, when groundwood pulp fibers were methylated, there was a drastic decrease in the chemically bound PMA, showing that the reacting groups in the pulp had been almost completely methylated. The results are discussed at some length and supported by tables and graphs.

Karl-Erik Eriksson, Hans Kiessling and Borje Steenberg. **Svensk Papperstidn. 64,** 329-335 (1961) (In English).

Gas permeability of plastic-coated papers

Emphasis was placed on paper that had been coated with polyethylene. Papers when initially high in gas permeability could be coated with polyethylene so as to render them highly impermeable. This effect was most pronounced when papers were smooth and prepared from a highly beaten pulp. The degree of impermeability was far less for the paper alone or for the plastic when these were tested separately. Evidently the pores of the sheet are sealed by the polyethylene and thus prevent penetration of the gas.

Various gases were used in the tests; these included hydrogen and argon, but the more crucial experiments were made with oxygen.

Tests were made with glassine and with vegetable parchment, which when treated with the plastic showed very low gas permeability. This work was done at the Institut für Lebensmitteltechnologie u. Verpackung in Munich.

K. Becker. **Das Papier** 15, 407-10 (1961) (in German).

Freeness and strength in groundwood pulps

Reference is made to the work of H. A. Paterson **[Pulp Paper Mag. Canada** 37, Convention issue 79 (1936)], in which he plotted the log. of Canadian freeness against Mullen strength of mechanical pulp and obtained linear relationships, irrespective of the operating conditions.

In the present work, analyses of samples from eleven groundwood mills over a three-year period, showed that a semilogarithmic plot of freeness versus breaking length gave a straight line relationship with parallel lines for all the mills, within statistically acceptable limits. Whereas a combination of strength and freeness by means of a Paterson diagram offers some possibilities for predicting or explaining variations as measured by these tests, caution must be exercised in the use of such diagrams, one of which is shown

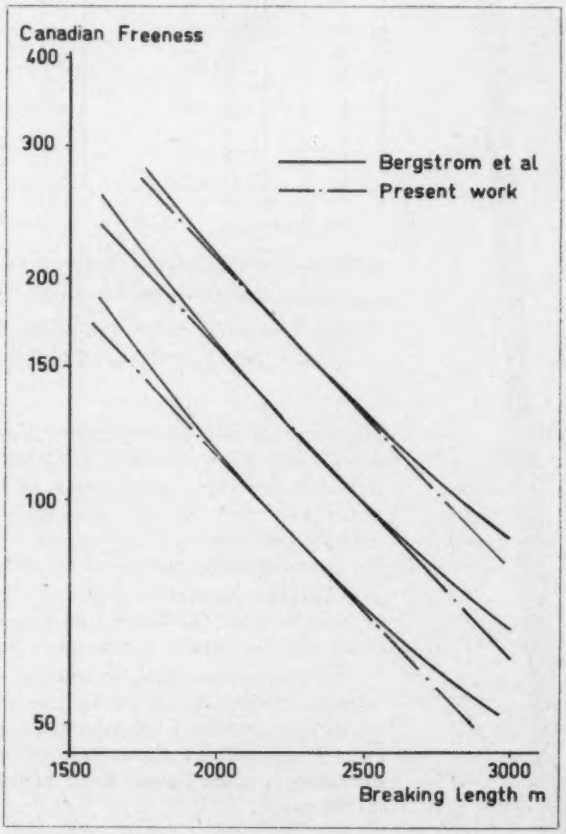


Figure 1

in Fig. 1, where the Paterson lines are compared with the exponential function according to Bergström Hellström and Steenberg, **[Svensk Papperstidn.** 60, No. 11, 409 (1957)]. Despite the interest in these Paterson lines, their limitations are discussed. Recent work on crill may hold promise for new lines of development in studying and judging groundwood quality.

Otto Brauns. **Svensk Papperstidn.** 64, No. 18, 662-666 (1961) (in English).

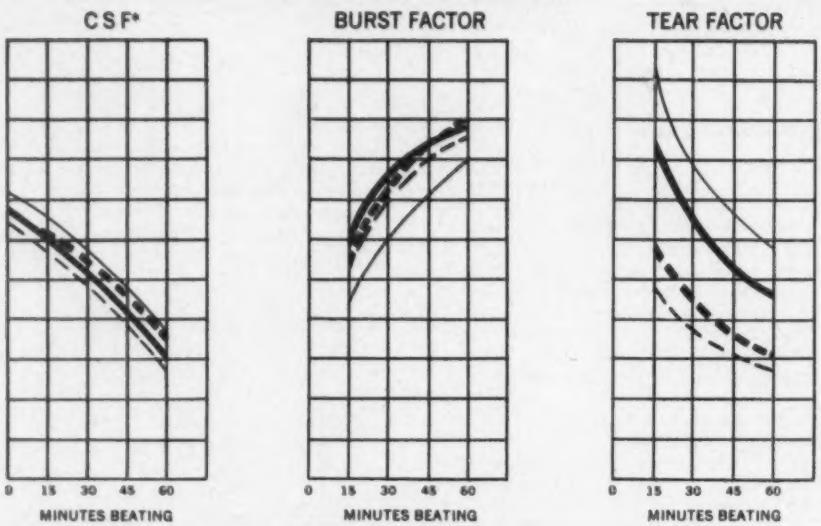
Continuous beating of pulp for condenser paper

Unbleached kraft pulp to be used (in Russia) for the manufacture of thin condenser paper was beaten in a conical refiner (MB-01, with basalt rods) in a series of pilot-plant experiments, and under commercial conditions, in similar refiners by a continuous process. Despite the reports of other

Continued on page 622

CELGAR KRAFT HAS BALANCED PROPERTIES

STRENGTH VALUES



*Canadian Standard Freeness

As shown by the above graphs, Celgar Kraft compares favourably with the world's best prime bleached kraft pulps in standard pulp tests.

In the all-important beating time to required papermaking freeness, it develops faster than other typical Canadian bleached kraft pulps, comparing favourably with the fast-beating Scandinavian furnish. This feature means high-volume output from repulping equipment at reduced power cost.

The bursting resistance of prime bleached Celgar Kraft exceeds or compares favourably with the best of its competitors while it is excelled only by West Coast bleached krafts in tearing resistance.

This unique and outstanding balance of properties at a high level can be achieved because of the Interior grown tree species used, the climatic conditions under which they grow and the modern process equipment installed in the new Celgar mill. These pulping characteristics, coupled with low beating time and good printability, place Celgar Kraft among the best bleached kraft pulps available in the world.

Distributors and agents for:

Celgar Kraft Pulps and Columbia Cellulose Viscose, Acetate and hardwood and softwood specialty sulphite paper pulps.

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...this equipment is second to none"...

says R. L. LEAF, Vice President
Shawano Paper Mills, Shawano, Wisconsin

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LAKEVIEW P.O. BOX SHAWANO, WISCONSIN

September 8, 1961

Mr. R. A. Peterson, President
Valley Iron Works Corporation
Appleton, Wisconsin

Dear Mr. Peterson:

We want you to know how delighted we are with our No. 2 Yankee Fourdrinier Paper Machine. The installation of the new VALLEY Fourdrinier Section and the VALLEY modifications to the press section complete the modernization program that we have had in progress on this machine for several years. Every bit of the original machine has been replaced, and as far as we are concerned No. 2 is now a VALLEY Paper Machine. We are as pleased with the equipment installed this year as we were with your air loaded stock entrance equipment that we installed last year, and that's saying a lot.

We had saleable paper on the reel in less than thirty minutes after putting stock on the wire, and in less than ten minutes after letting down the pickup roll. We passed previous quality and production marks in the first eight hours of operation, and the continuing improvement in both quality and production since then has been extremely satisfying.

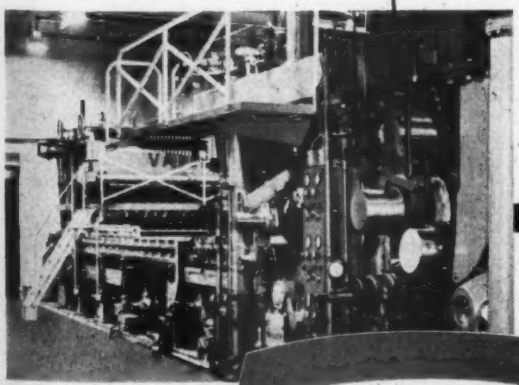
We feel that this equipment is second to none, but that is only part of the story. The service and cooperation that you have given us from the idea stage right through the present time has been truly outstanding. Everyone here at Shawano Paper Mills joins me in saying that it's been a pleasure doing business with all of you.

Sincerely yours

SHAWANO PAPER MILLS

Robert L. Leaf, Jr.
Vice President

RLL:DA



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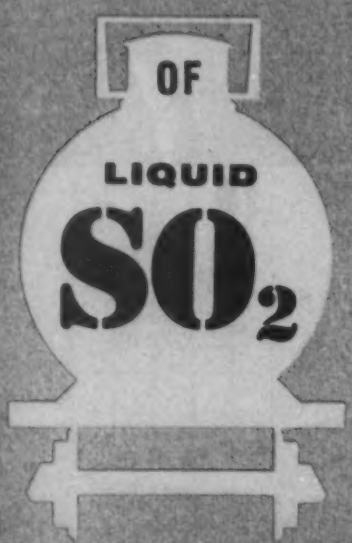

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FOREIGN ABSTRACTS

Continued from page 619

authors the present experiments indicated that continuous beating in refiners could be used in the production of highly beaten pulps (96° Schopper-Riegler) without undue shortening of the fibers. Furthermore, the process proved more economical than did batch-wise beating in hollanders. To insure the best results the stock consistency had to be increased to 4.7 to 5 per cent, and the beating time extended to about 9 hrs. A continuous system of 15 to 17 conical refiners connected in series was required in order to feed three paper-machines manufacturing paper having a thickness of approximately 10 microns.

Six references. S. M. Karlitskii and L. E. Komarovskii. **Bumazh. Prom.** 36, No. 2, 12-14 (Feb. 1961) (in Russian); through **Abstr. Bull. Inst. Paper Chem.** 32, 199 (1961).

Pulping by use of various gases in dimethylsulfoxide

When hydrogen sulfide, sulfur dioxide or nitrogen dioxide was dissolved in dimethylformamide (DMF), none of these solutions showed any appreciable pulping action when applied to spruce or aspen. Chlorine in DMF showed some pulping activity, but the delignification was very incomplete, and a dark pulp resulted. On the other hand, sulfur dioxide, nitrogen dioxide, or chlorine in dimethylsulfoxide (DMSO) showed excellent pulping properties, both with sawdust and chips, even though DMSO alone was completely inactive. The effects of the following variables on the pulp yields, and lignin and pentosan contents were studied: cooking time, temperature, concentration of the gas (in grams per 100 ml.), and the amounts of water added to the solvent. Using solutions containing 5 per cent chlorine, 2 per cent nitrogen dioxide, or 5 per cent chlorine in DMSO, black spruce wood meal gave pulps low in lignin and high in alpha cellulose. The cooks were carried out at 140° C. (or lower) for 0.5 to 3 hours. Aspen gave similar results, and this wood was pulped even more readily. In one experiment, aspen cooked with 5 per cent sulfur dioxide in DMSO containing also 5 per cent water for 2 hours, at 140° gave a pulp yield of 49.7 per cent and this pulp contained only 0.1 per cent lignin. In general the addition of water caused a more rapid digestion, and it was pointed out that DMSO itself is extremely hygroscopic. Not only were many of the pulps high in alpha cellulose, (in some cases up to 94.5 per cent) but they gave viscosities in cupriethylenediamine that were often twice as high as those of a standard bleached sulfite pulp. Dissolved lignin could be recovered readily, simply by the addition of water, and, since the cooking conditions were mild, it may be possible that this lignin can be used for structural purposes. Solvent recovery should be facilitated since no inorganic salts are added.

Seventeen graphs and 5 tables. L. P. Clermont and F. Bender. **Pulp and Paper Mag. Canada 62,** No. 1, T28-T34 (1961).

Components of Finnish light tall oil

A description is given of the tall oil distillation plants in Finland, and earlier studies on tall oil are reviewed. In the present paper special reference is made to the small amounts of aromatic components in these light oils. However, the general composition of these oils were also determined.

Seven samples (obtained from three Finnish plants) were analyzed. The neutral fractions contained 58 to 74 per cent of hydrocarbons that could be eluted from alumina chromatographic columns by means of petroleum ether. It was found that the usual analytical methods were inapplicable

Continued on page 638

Dr. Melvin Nord

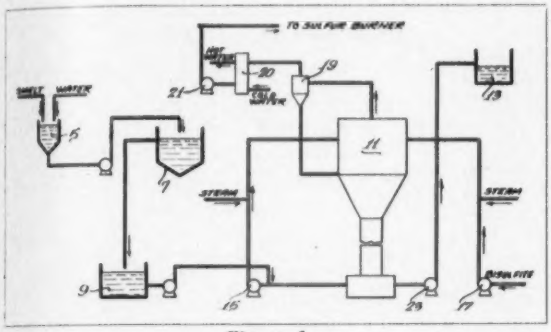

Figure 1

Treatment of spent sulfite liquor

U. S. Patent 2,987,432, issued June 6, 1961, to Roy P. Whitney, Shu-Tang Han, James F. Bakken, and Richard B. Kesler, assigned to The Institute of Paper Chemistry, provides a method of preparation of cooking liquor for the sulfite process from spent liquor.

In accordance with the invention, spent liquor from a sodium base sulfite pulping process is concentrated to 55 to 70 per cent solids content. The concentrated liquor is then burned under reducing conditions so as to limit the removal of sulfur as much as possible. In this connection, a major portion of the sulfur should be retained in the resulting smelt. The smelt formed by burning primarily comprises sodium sulfide and sodium carbonate.

As shown in Fig. 1, the smelt from the furnace is dissolved in water in tank 5 to provide a dilute aqueous solution. This solution is passed to clarifier 7. In the clarifier, the solution is separated from any undissolved solids. It is then pumped to a storage tank 9.

An analysis of a typical smelt solution of this invention leaving the dissolving mask 5 is given below. The analysis is on the basis of one ton of pulp.

Compound:	Lbs.
Na_2S	147
NaHS	30
NaOH	22
Na_2CO_3	114
Na_2SO_4	14
Total	327

The smelt solution is then pumped to a conversion tower 11 in which the solution is converted to the treating liquor. Upon suitable conversion, the liquor is then stored in a tank 13 for use in the digester.

Conversion tower 11 may be of the type shown in Fig. 2, for continuous operation.

The smelt solution, or green liquor, is introduced into pump 15 and is mixed with steam to heat it, whereupon it is introduced into the conversion tower 11. Sodium bisulfite liquor which has been heated by steam, is also pumped from a pump 17 into the conversion tower 11. The gases which leave the conversion tower are introduced into a cyclone separator 19, which returns any liquid to the tower 11. The gases leave the cyclone 19 and enter a condenser 20 and the remaining gas, referred to as sour gas, is passed through a fan 21 to a sulfur burner (not shown). A portion of the liquor which has been recovered as cooking liquor leaves the regeneration system 11 through the pump 23, and another portion of the liquor is mixed with the green liquor and introduced into the pump 15. Thus, some of the liquor is recycled.

The tower 11 is operated at the boiling point of the combined spray, that is, at least about 212°F. to 214°F. under atmospheric pressure conditions. Preferably, sufficient extra heat is continuously added in the liquor and thereby to the spray to provide an increased boiling rate.

During passage of the boiling spray down through the packing, it countercurrently contacts steam which has entered the sump 35 of the conversion tower 11. Steam entering through line 40 passes up through the packed section 33 of the tower 11. The steam is at a temperature which is a function of the pressure conditions in the tower and the steam aids in stripping hydrogen sulfide formed during the reaction between the sodium bisulfite and the sodium sulfide in the spray. The steam has the additional effect of aiding in maintaining the downflowing spray solution at the desired temperature.

Hydrogen sulfide and other effluent gasses pass from the tower through stack 43 after flowing around the baffle 45. Baffle is provided so as to substantially eliminate exiting of inflowing bisulfite solution spray and smelt solution spray before their passage down through the packed section to the sump 35.

When the liquor reaches the sump 35, it passes from the tower 11 through pipes 47 and 49, pipe 47 conducting the liquor to the storage tank 13 and pipe 49 conducting the liquor to the pump 15 for recycling.

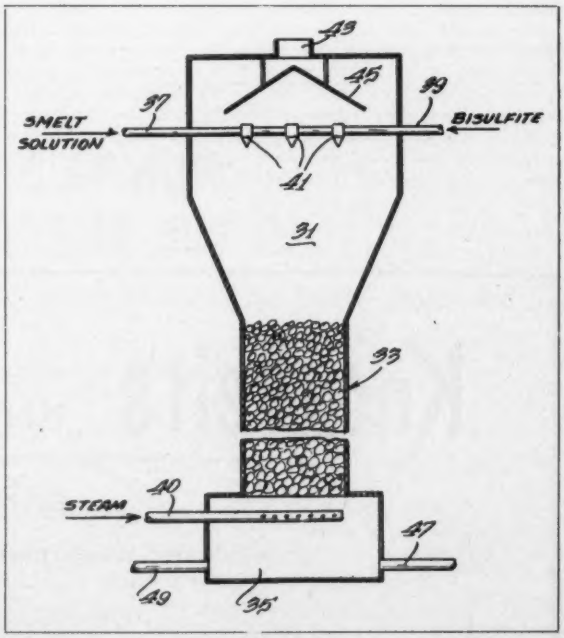

Figure 2

Integration of sodium based sulfite and sulfate pulping processes

U.S. 2,974,081, issued March 7, 1961 to William A. Biggs, Jr., and Julius D. Robertson, assigned to Sonoco Products Co., describes an integrated process for pulping wood by a sodium based sulfite process and by the sulfate process, in which sulfate white cooking liquor is produced having sufficiently high sulfidity to avoid the necessity of adding the usual salt cake and sulfur.

To the sulfate black liquor is added concentrated spent liquor from the sulfite process which has been acidified with sulfuric acid and from which substantially all acetic and formic acid have been removed. The resulting mixture is concentrated and burned. The resulting smelt is then dissolved to produce sulfate green liquor, which is then causticized.

The quantity of spent liquor from the sulfite process is sufficient to supply all of the added sulfur for the sulfate process.

Manufacture of Glossy Coated Paperboard Sheets

U. S. Patent 2,982,245, issued May 2, 1961, to Howard J. Curler and Richard M. Bauer, assigned to American Can Co., provides a machine for the manufacture of a highly polished specular wax composition surface on a succession of paperboard sheets.

A molten wax composition coating is applied to at least one surface of the sheets. The wax coated surface of the sheets is then applied in intimate overall and fixed adhered contact with a flexible endless conveyor belt having a highly polished surface maintained at a temperature lower than the solidification temperature for the wax composition. The conveyor belt is moved horizontally until the coating is solidified. The successive sheets are then removed from the conveyor belt.

Wax Impregnated Corrugated Paperboard

U. S. Patent 2,982,333 issued May 2, 1961, to John R. Little and assigned to West Virginia Pulp & Paper Co., provides a process for making a double-face corrugated paperboard, the moisture resistance and strength of which is improved through the pressure of wax penetrant directly applied to the corrugated web.

A first liner web is adhesively combined with a corrugated web to provide a single-face board. A wax-resist bodied unset heat-actuatable adhesive mixture is then applied to the exposed crests of the corrugated web to provide a temporary wax barrier on the crests. The exposed side of the corrugated web is then exposed to a molten-wax paper-penetrant, which is prevented by the wax-resist character of the bodied unset adhesive mixture from directly contacting the surfaces of the crests. A second liner web is then applied to the crests and heat is applied, thereby setting the adhesive mixture to establish adequate bonding.

Rosin size

U. S. Patent 2,985,537, issued May 23, 1961, to Spencer H. Watkins and assigned to Hercules Powder Co., provides a paste rosin size having improved stability against crystallization obtained by reacting rosin with formaldehyde or paraformaldehyde in the presence of an acid catalyst above 100°C., and then partially neutralizing the resulting product with aqueous alkali.

Other Patents of Interest

Subject	Inventor or Assignee	Patent No.	Date
Paper contamination classifier	Donald Rushmore	2,976,719	3/28/61
Paper machine	Black-Clawson Co.	2,976,924	"
Reinforced suction box cover	Appleton Wood Products Co.	2,976,925	"
Insert for bag valves	St. Regis Paper Co.	2,977,038	"
Apparatus for unwinding a supply roll in paper processing machines	Jagenberg-Werk A. G.	2,977,058	"
Paper drying machine	Jamar-Olmen Co.	2,977,686	4/4/61
Fourdrinier machine belt	Lockport Felt Co. Inc.	2,978,023	"
Molded pulp carton	Packaging Corp. of America	2,978,162	"
Clearance pad	American Box Board Co.	2,978,163	"
Bags	Bemis Bro. Bag Co.	2,978,164	"
Packaging folder	Standard Packaging Corp.	2,978,165	"
Corrugating single facer	Harry W. Wilson	2,979,112	4/11/61
Apparatus for shrinking paper	W. R. Grace & Co.	2,979,131	"
Holder for milk cartons	Harold E. Noffsinger	2,979,225	"
Container carrier	Unipak Cartons Ltd.	2,979,226	"
Molder pulp carton	Keyes Fibre Co.	2,979,245	"
Foam plastic coated carton	Lord Baltimore Press Inc.	2,979,246	"
Heat sealable carton	Fibreboard Paper Prod. Corp.	2,979,247	"
Packaging of fragile articles	Washington Box Ltd.	2,979,248	"
Box with self-locking tab	Lester D. Gill	2,979,249	"
Cartons	Harry C. Hobbs	2,979,250	"
Folding boxes of the tray type	The Procter & Gamble Co.	2,979,252	"
Cover lock box	Bergstein Packaging Trust	2,979,252	"
Method of banding cardboard cartons	Weyerhauser Co.	2,979,871	4/18/61
Rotogravure printing of paperboard	Diamond National Cor.	2,980,015	"
Applying flat strips to corrugated paper	Sherman Paper Prod. Corp.	2,980,159	"
Expandable transfer head for pulp molding machine	Diamond National Corp.	2,980,183	"
Box	F. M. Howell & Co.	2,980,241	"
Open faced cartons for collapsible tubes	Procter & Gamble Co.	2,980,242	"
Molded pulp tray dispenser	Pacific Pulp Molding Co.	2,980,289	"
Paperboard fluid container	Richard Sisco	2,980,304	"
Collapsible tray	Federal Paper Board Co. Inc.	2,980,310	"
Container	American Can Co.	2,980,311	"
Bag	Bemis Bro. Bag Co.	2,980,313	"
Bag	Richard E. Adams	2,980,314	"
Carton	KVP Sutherland Paper Co.	2,980,316	"

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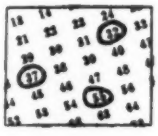

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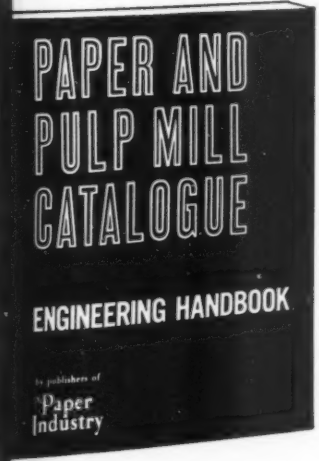

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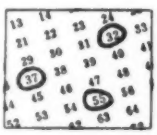

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A new steam jacketed acid pump, which will handle any solution which freezes above ambient temperatures such as ammonium nitrate, liquid sulfur, asphalt, etc., is now available. Multiple steam line connections are provided on the case, case plate and stationary seal ring housing. In use, any two connections on each jacketed part are connected to the incoming and return steam lines. Steam connections are tapped for ¾ in. pipe. — A. R. Wilfley Sons Inc.

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Coating materials

Resyn 3600, a polyvinylidene chloride latex, is a new coating material for packaging materials which possesses unique properties will not only provide outstanding resistance to moisture, gases and greases but indicates exceptional resistance to strong acids, alkalies and many solvents.

The suggested possibilities as applied to new packaging designs include: linerless cereal cartons; paperboard oil and grease containers; high-barrier polyolefin wraps for meats and dairy products; frozen foods; and rigid polyolefin bottles for volatile products.

These materials also show varied non-food uses such as labels, hospital bags, cigarette packs etc. and can be applied by conventional coating techniques.

Substances composing Resyn 3600 have been cleared or extended by FDA and the Meat Inspection Division of the Dept. of Agriculture has ruled that it has no objections to the use of paperboard coated with this substance as packaging for meat and meat food products. — National Starch & Chemical Corp.

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Slitter knife grinder

Known as the SK-24 High Power, this grinder utilizes a 12-in. wheel mounted on a precision Pope spindle. The 3-hp motor and all supporting members are made heavier to give support to the larger grinding head assembly. Down feed, cross feed and oscillation of the grinding head are each equipped with motor drive and controls are automatic — Hanchett Mfg. Co.

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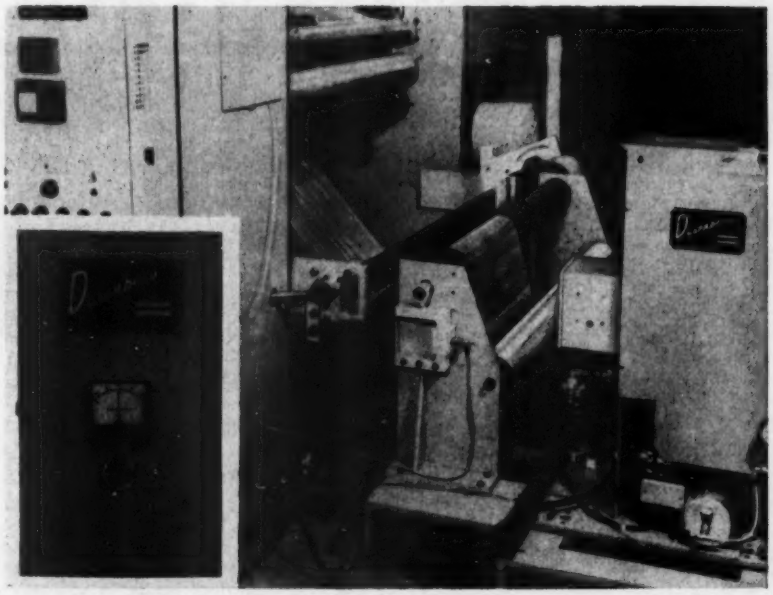

Web tension controller

The Auto-Tensioneer, a newly developed general purpose automatic controller, provides continuous control of web tension in printing and processing film, paper and fabrics.

Its unusual versatility provides maximum production use when installed at the unwind, rewind or any location. There is only one tension setting to be made, and an indicator shows the web tension at all times.

Among the component parts of the controller which is served by a torque motor, are an amplifier, lubricator, air ballast tank and strain gauges. — John Dusenbery Co. Inc.

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Air attrition mill

A newly developed air attrition mill is capable of reducing friable materials to sub sieve size and classifying the material in the same operation. The machine can be used for processing chemicals, resins, dyes, plastics and other materials requiring super fine pulverization and classification. — Bauer Bros. Co.

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Valve with sealing capsule

The "Con-O-Sphere" ball valve features a sealing capsule which is a conical-shaped Teflon unit that contains the metal ball. The confined ball is said to turn easily and smoothly although there is no clearance between the ball and the Teflon. This provides the maximum possible sealing area. It has applications in all process plants where efficient handling of gases, liquids or viscous or abrasive ladings is vital. — W-K-M Division, ACF Industries Inc.

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Chlorine indicator

A new electro-chemical instrument which analyzes chlorine residuals in treated water has been released. Residual chlorine (free or total) acts on a pair of electrodes in a sampling cell contained in the new series A-780 indicator.

Registering the slightest residual change (sensitivity is 0.01 ppm) 10 sec. after the initial sampling, the indicator may be had with any one of three arrangements: to indicate residuals only; to indicate residual valves

Continued on page 627

ATLAC® 382

GLASS REINFORCED PLASTIC

corrosion resistant
construction material
for pulp and paper
mill equipment

Where corrosion takes too great a toll—in tanks, ducts, fume hoods, chests, vapor condensers (and similar equipment)—you and your fabricator should take a good look at glass reinforced ATLAC 382 bisphenol polyester resin. It offers seven distinct advantages in pulp and paper mill operations as a construction material:

1 **Corrosion resistance** ATLAC 382 is virtually immune to the bleaches, acids, salts and alkalis used in paper making—at temperatures below 250°F. One example: a 4,400-gallon tank of ATLAC 382 is still in mint condition after two years of alternately storing 14% sodium hypochlorite and caustic soda.

2 **High strength** Pound for pound, reinforced ATLAC 382 is stronger than steel. You get the same total strength with less total weight. Examples: 30,000-gallon tanks of ATLAC 382 are completely self-supporting...and even the largest hoods need no corrosion-prone metal bracing.

3 **Light weight** Equipment of ATLAC 382 is generally lighter than wood, Transite, or metal equipment. In one case, a 1,000-gallon tank of ¼" ATLAC 382 weighed 300 pounds, compared with 4.3 times that weight for alloy steel.

4 **Economy** ATLAC 382 equipment generally costs one-half to one-third less than rubber-lined or tiled equipment, and is normally equal to 304 and lower in price than 316 stainless steel. It is almost always a better buy than the more exotic metals if temperatures and pressures are not too high.

5 **Design flexibility** There are very few practical limits in size and shape for equipment of ATLAC 382. What's more, equipment can sometimes be redesigned to take advantage of ATLAC 382's unique structural characteristics—resulting in extra simplification, practicality and cost reduction.

6 **Easy installation** Because of reinforced ATLAC 382's light weight, relatively few men are needed to install it. Also, since it can be joined right on the plant floor, large equipment can be shipped in sections and field-erected. Equipment is readily changed and modified. Ducting can be relocated and reassembled without special equipment or personnel.

7 **Low maintenance** ATLAC 382 equipment needs virtually no periodic maintenance. It never needs painting or rust removal, always looks clean and attractive. Physical damage is easy to repair generally without down-time.

But why not get the feel of ATLAC 382 for yourself? Let us send you details on ATLAC 382, its uses in the pulp and paper industry, and a comparison of the corrosion resistance of various reinforced plastics. At the same time, we'll be glad to supply a test sample so you can prove to your own satisfaction that ATLAC 382 is well worth considering. For your sample—and data on ATLAC 382—mail the coupon, or write Atlas direct.

Atlas Chemical Industries, Inc
Wilmington 99, Delaware

Please send details on ATLAC 382, and a free test sample.

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

ATLAS CHEMICAL INDUSTRIES, INC.

For more data circle 132 on Post Card

NEW PRODUCTS

Continued from page 625

and control alarms; or to indicate residual values and control chlorinator output.

The W&T indicator operates safely in damp industrial areas. — Wallace & Tiernan Inc.

Circle No. 7 on Readers' Service Card

Knife cutter

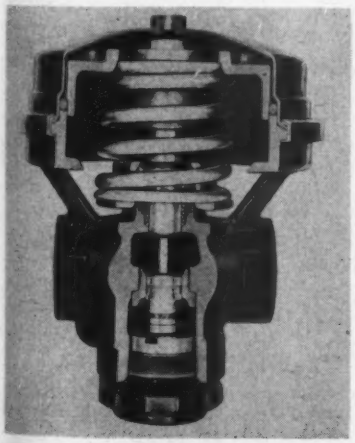
With a new style 18-in. knife cutter constructed in either cast iron or cast steel, having a maximum of 30 hp, the user is able to feed a stock sheet form through a roll feeder or in granular or lump form through the wide throat hopper. It is especially qualified for chopping, flocking and other operations. — Sprout, Waldron & Co.

Circle No. 8 on Readers' Service Card

Wrapping machines

A new line of wrapping machines featuring high speed operation, with ability to automatically overwrap a wide range of products in all commercial flexible wrapping materials is now available. The units operate with a new type rotary shear and continuous motion paper feeding mechanism. The electronically controlled drive mechanisms provide ease in speed adjustment, positive brake action and lengthy service. — Hayssen Mfg. Co.

Circle No. 9 on Readers' Service Card

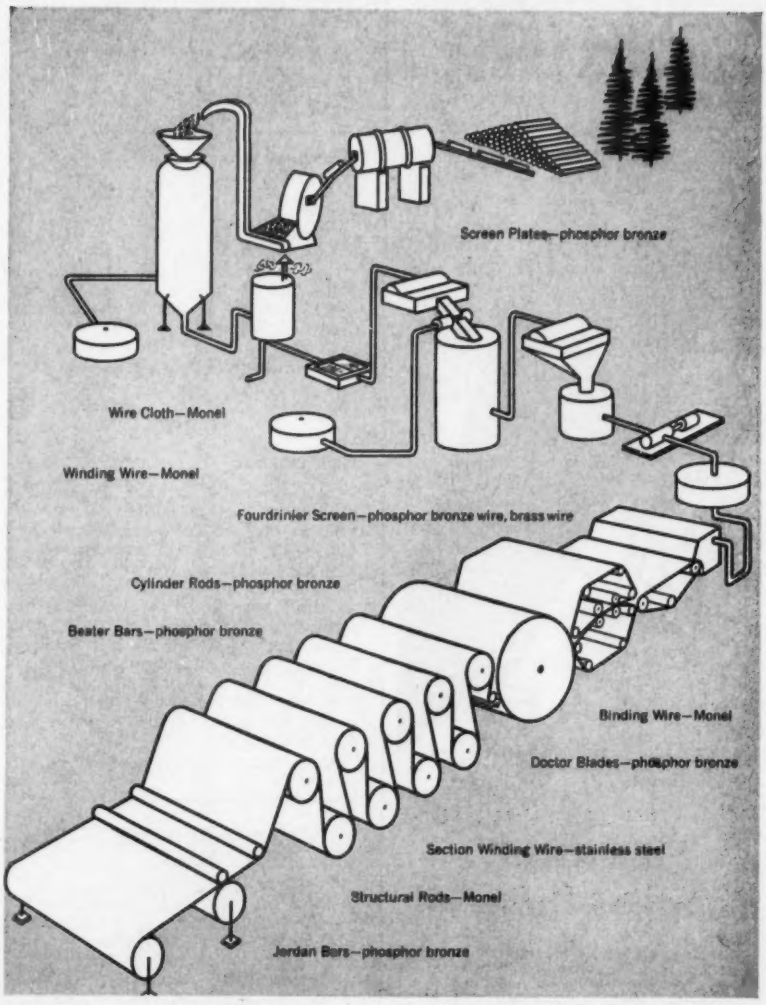


Cylinder-operated valves

A new Taylor 1000V Series of cylinder-operated valves has been developed with two- or three-way operation.

The rugged iron body and spider provide added strength while weight

Continued on page 628



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For exceptional resistance to wear and corrosion, count on Porter to supply the *right* alloy for critical paper machinery components. For Jordan Bars, Doctor Blades and other vital paper machinery equipment, Porter alloys have unmatched strength and durability—feature exceptional machineability and reworking characteristics, and will not discolor paper pulp.

Long known to the industry as the world's largest producer of phosphor bronze Fourdrinier wire, Porter is also your *single reliable source* for a wide range of special alloys in 8 basic groups of wire, rod and strip . . . phosphor bronze, nickel silver, cupro nickel, brass, stainless steel, nickel, Monel and Inconel.

Ask for a free copy of "Alloys for Industry" describing these alloys. Write H. K. Porter Company, Inc., Riverside-Alloy Metal Division, Riverside, N. J. Or check the Yellow Pages for our nearest sales office. Where there's paper made—there's Porter.

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For more data circle 134 on Post Card

NEW PRODUCTS

Continued from page 627

reduction is achieved by using aluminum pistons and cylinders.

Service ratings to 300 or 500 psi at temperatures up to 400° F are additional features found in the cylinder-operated valves. — Taylor Instrument Cos.

Circle No. 10 on Readers' Service Card

Gas burner

This type "K" burner designed to produce the major portion of its radiation in the far infra-red wavelengths above 2.7 microns, is manufactured in 2½, 4½ and 7 in. lengths, which can be mounted end to end on a common manifold which allows continuous heat radiators of from 2½ in. to 100 ft. or more. The width of the burner is 6⅝ in. Its profile adjustment for fuel permits a profiled heat radiation adjusting to varying heat requirements across the width of a product. — Red-Ray Mfg. Co. Inc.

Circle No. 11 on Readers' Service Card

Lattice braid packing

Two new styles of Teflon-impregnated lattice braid packing, are now available. Both are said to contain more than 30 per cent Teflon by actual weight to provide greater stability under temperature changes, resistance to glazing, minimum swelling, reduced friction and wear plus resistance to chemicals and corrosives. The new packings are immediately available in reel or spool form from ¼ to 1 in. — Garlock Inc.

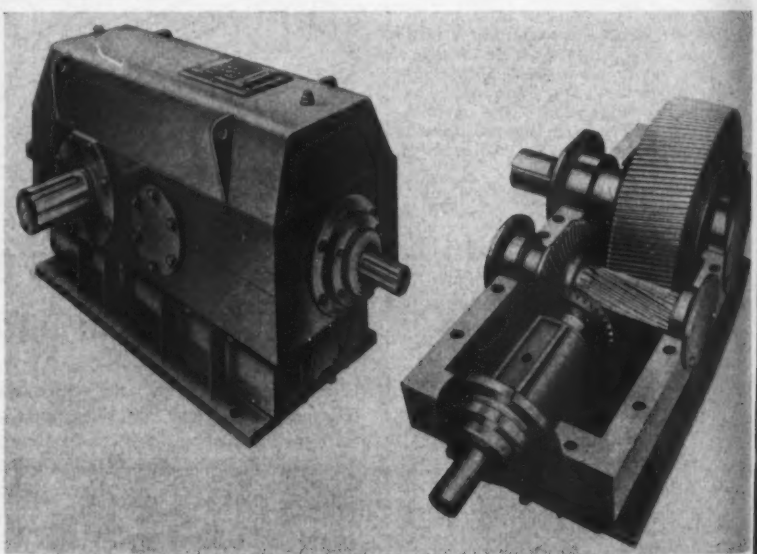
Circle No. 12 on Readers' Service Card

Roll wrapping system

Rolls can be wrapped at the rate of one in less than a minute with this new automatic flexible right angle packaging system which cuts the wrapping paper to the required size without manual settings, wraps and crimps the ends and ejects the roll ready for the roll header.

It can wrap single or multiple ply including vapor seals. It can be varied to use inner heads only or a combination of inner and outer, or outer heads only. Although these dimensions are not limiting, the system will automatically wrap rolls from 7 in. to 112 in. in face length and 15 in. to 42 in. diameter in any order. — Valley Iron Works Corp.

Circle No. 13 on Readers' Service Card



Right angle gear drives

A new line of heavy-duty right angle shaft enclosed helical gear drives built with fabricated steel housings is available in 45 sizes in double and triple reduction types. Standard gear ratios are from 9.39:1 up to 211.0:1. Horsepower capacities to 1460 hp and torque capacities to 2,210,000 In.-Lbs. permit choice of correct size for any application.

The drive shafts run in heavy-duty, anti-friction bearings and are held in accurate alignment. The helical gearing is accurately hobbed for strength, durability and uniform tooth deflection under load. Spiral bevel gearing used in the Maxi-Power Right Angle Drive is cut to provide highest possible efficiency in the double and triple reduction types. — Foote Bros. Gear & Machine Corp.

Circle No. 14 on Readers' Service Card

Continued on page 631

for paper and board coating save with high-fluidity Penford Gums

the new high-fluidity Penford Gums replace synthetic latices in high-solids pigmented coatings. Their fluidity plus other traits make these hydroxy ethyl ether derivatives suitable for use as the sole adhesive in some pigmented coatings and in combination with latices in other cases. Coatings so made have low stable viscosity, high gloss and excellent ink receptivity.

The new high-fluidity Penford Gums are available in two groups: the 2000 and 3000 series. Both groups offer a wide range of viscosity. Use the coupon to request additional information and formulas.

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Please send me data on the new high-fluidity Penford Gums (2000 and 3000 series) for use in connection with.....

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Name.....

Title.....

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Street.....

City.....State.....

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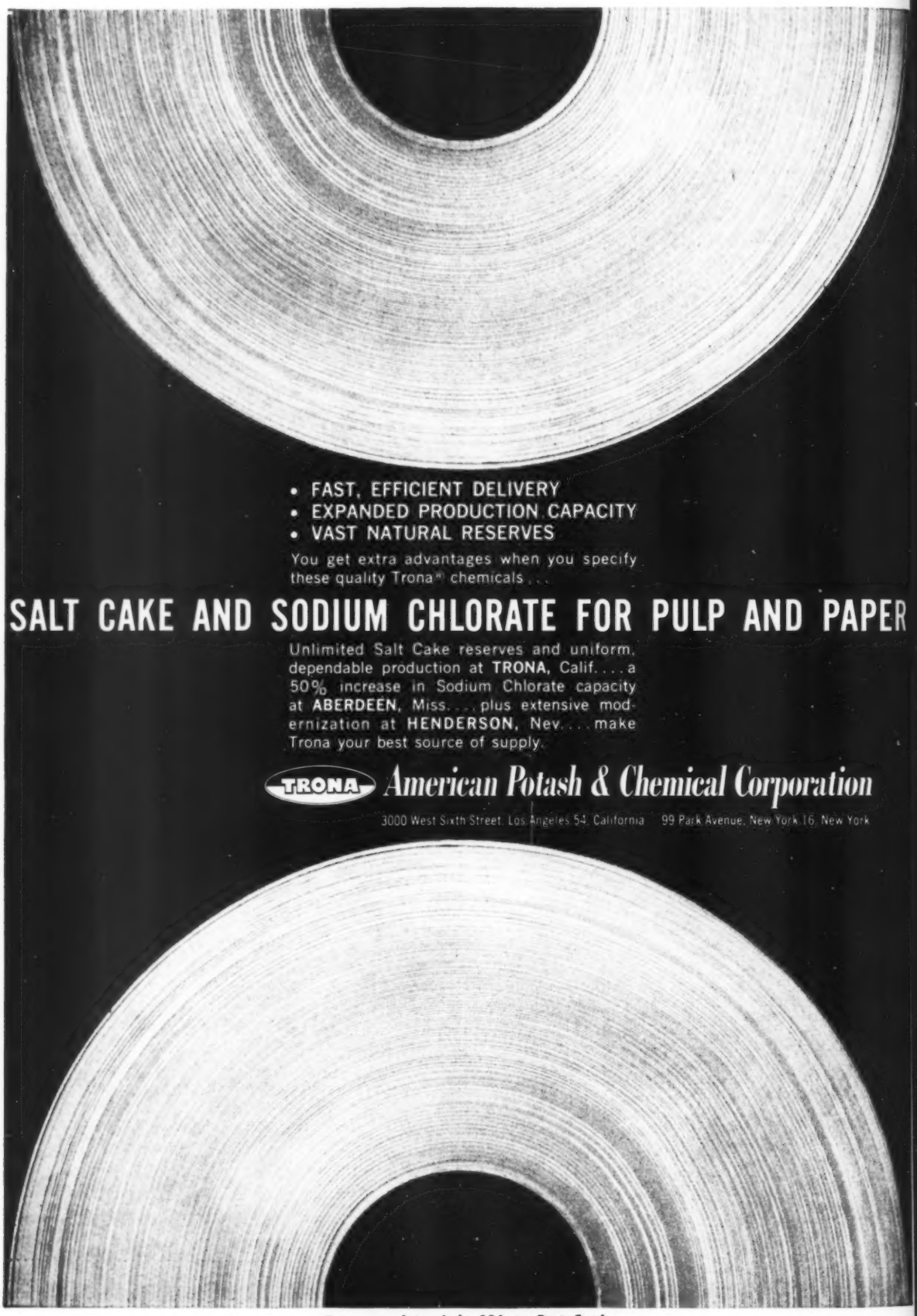
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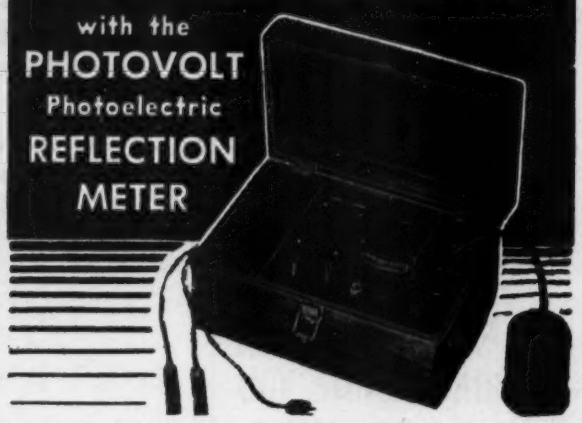

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of pulp and paper in terms of TAPPI specifications.
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tests on paper, cardboard, and other paper products.
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For more data circle 137 on Post Card

NEW PRODUCTS

Continued from page 628

Potato starch sizing

Arogums, an improved line of oxidized potato starches comes in several viscosities meeting varied operational requirements for use with tub, calender and size press.

With improved "long" textured film it lays a tough, flexible surface fiber providing both sheet strength and excellent surface characteristics. In calender sizing these starches improve printability and reduce penetration of gloss inks in paperboard. — Morningstar-Paisley Inc.

Circle No. 15 on Readers' Service Card.

Diesel engine

The Model 50-A, new in the series of smaller, faster diesel engines, is a multi-purpose, lighter-duty engine well adapted for electric power generation and installations requiring uninterrupted running.

All models operate at 1800 rpm. and the units up to 100 hp. are available in speeds up to 2200 rpm. The overall range will go from 37 to 670 hp. The 200 kw. continuous rated Model 50-A is 11 ft. long, 3 ft. 6 in. wide and 5 ft. 8 in. high. Direct fuel injection into the toroidal cavity in each piston assures easy, rapid starting. Interchangeability of many parts is accomplished by limiting bore and stroke to two general sizes.

Five versions operated at 1800 rpm. are available. Larger and smaller sizes will soon be available. — Fairbanks, Morse & Co.

Circle No. 16 on Readers' Service Card

Pilot plant

A complete pilot plant approximately 28 ft. tall and 3 ft. in diameter, designed to permit accumulation of waste treatment and pollution data makes possible actual analysis of municipal or industrial wastes, testing the effectiveness of indicated treatment prior to investment of full-scale equipment.

Operating on a trickling-filter principle, the heart of the structure is Dowpac® 20A, a plastic packing material fabricated from saran.

The completely assembled pilot plant is shipped as a tubular steel structure with all items necessary to full operation. Customers furnish the inlet and effluent piping plus an 8-ft. sq. concrete foundation pad.

The unit may be purchased or leased with options for monthly rental after the basic contract period of six months. — Dow Chemical Co.

Circle No. 17 on Readers' Service Card

Floating foam arrestor

A floating foam arrestor is now available for use on high speed, high shear mixers. Floating mats are custom cut to customer specifications to cover the surface of the material in the mixing tank. They are attached to the shaft of the mixer and adjusted to lay on the surface of the liquid mix. Material forced to the surface during mixing is deflected horizontally along the bottom of the mat and down the sides of the mixing tank. It is available on a full range of mixers with capacities from 3 gal to stationary units with capacities in excess of 3000 gal. — Barrington Industries Inc.

Circle No. 18 on Readers' Service Card

Strip-chart recorder

An electrically-operated strip-chart recorder automatically and continuously records operating time and down time up to ten machines or processes simultaneously. Known as the Model OR-4 Operation Recorder, the unit avoids maintenance problems by using waxed charts. Behind the chart is a stationary heating element for each channel that melts a small portion of wax allowing the blue chart paper to show whenever a machine is operating. The chart is driven by a timing motor to form this melted portion into a continuous vertical line. — Electric Tachometer Corp.

Circle No. 19 on Readers' Service Card

Continued on page 632

NOW—CHECK ACCURACY WHILE YOU CHECK MOISTURE!

New Electronic Moisture Registers have first "built-in standard" in a 3-second, portable moisture tester.

NOW DIAL ACCURACY IS ASSURED, even under the extremes of production-line use. With *self-checking standard*, Moisture Register's new Model 5's are checked and adjusted for calibration accuracy right on the job—by any untrained operator. He simply fits electrode to standard. Then with new trimmer he sets dial for perfect alignment. Gives calibration adjustment *in the field*. You get practical accuracy down to 0% ... 3-second spot tests for moisture wherever your product may be. Portable, light weight, battery operated, new rugged construction with miniature tube. Factory-set to your needs.

For faster testing of—

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- Paperboard
- Insulation boards
- Paper Bags
- Plastics

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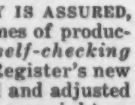


ELECTRONIC MOISTURE REGISTER Instruments

Moisture Register Company, Dept. PI
P. O. Box 910, Alhambra, California
Please send data on new Model 5's.

We are testing _____

in moisture range from _____% to _____%

Firm _____

By _____ Title _____

Address _____

City _____ State _____

For more data circle 138 on Post Card

NEW PRODUCTS

Continued from page 631

Anti-foaming agent

A new anti-foaming agent that contains no silicones, does not separate, and is almost water-white has been developed. The agent, called Ex-Foam 333, has a low specific gravity and high bulking value. — Troy Chemical Co.

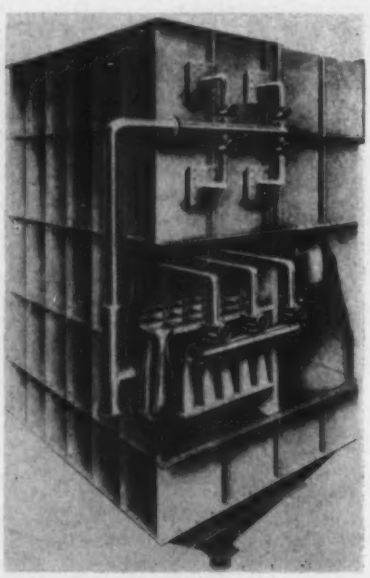
Circle No. 20 on Readers' Service Card

Two packing lubricants

Luball, with the new additive molybdenum disulfide, and Compound No. 2 are two new packing lubricants developed to improve the performance of packings.

For use against water, steam and chemical service up to 500°F, the lubricant prevents excessive friction, scored rods, leaks and ultimate destruction of the packing. — Garlock Inc.

Circle No. 21 on Readers' Service Card



Venturi scrubber

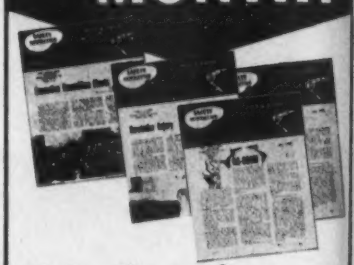
Manufactured under an exclusive U. S. license from Waagner-Biro, Austria, the new venturi scrubber for separating entrained solids from high-temperature gases in the pulp and paper, chemical and other related fields, offers advantages of low pressure drop and low water requirements.

The scrubber is unique in that it subjects the exhaust gases to a double scrubbing action as they pass through a bank of venturis. These gases are cleaned of dust particles as small as 0.05 microns at efficiencies of 99 per cent plus. — Buell Engineering Co. Inc.

Circle No. 22 on Readers' Service Card

You can have Safety Know-how and experience delivered to your desk . . .

EVERY MONTH!



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NEW LITERATURE

Books

FOREST MANAGEMENT, by: H. Arthur Meyer, Late Professor of Forestry, Pennsylvania State University; Arthur B. Recknagel, Forestry Consultant, St. Regis Paper Co.; Donald D. Stevenson, Chief Forester, Buckeye Cellulose Corp.; and Ronald A. Bartoo, Associate Professor of Forestry, Pennsylvania State University. Published by Ronald Press Co., 15 E. 26th St., New York 10, N.Y. 282 pp. Price: $8.50.

This is the second edition of this book which first appeared in 1952. The authors discuss the responsibility and general objectives of forest management as it has evolved in this country, problems of organizing a property, the subdivision, the classification, and the place of growth data. Four actual plans for forests of various sizes, in Massachusetts, Tennessee, Idaho and California, are presented in detail with critiques in order to demonstrate and to stress the importance of applied and realistic plans.

WILLIAM B. GREELEY, A Practical Forester, by George T. Morgan, Jr. Published by The Forest History Society, Inc., 2706 West Seventh Blvd., St. Paul 16, Minn. 82 pp. Price: $2.95.

This biography analyses Greeley's contributions to American forestry giving special consideration to the years 1904-1928 during which Greeley rose in the ranks of the U. S. Forest Service to become Chief Forester. His leadership in formulating an effective national forest policy is recounted with particular emphasis on the role he played in establishing the Clarke-McNary Act of 1924.

Booklets

ATOMIC ENERGY COMMISSION RESEARCH REPORTS PRICE LIST NO. 36. A new edition of the semi-annual price list of all unclassified AEC research reports for sale by the Office of Technical Services, Business and Defense Services Administration, U.S. Dept. of Commerce, Washington 25, D.C., has recently been published. The five-page list includes more than 3500 AEC reports in the OTS collection as of July 1961, and may be obtained free by request from OTS.

TEST PROCEDURE FOR WATER VAPOR TRANSMISSION RATE has been published by Plastics Extrusion Coaters Group, Specialty Paper & Board Affiliates Inc., 122 East 42nd St., New York 17, N. Y. The bulletin describes a test procedure for water vapor transmission rate for plastic extrusion coated substrates perfected and adopted by the Plastics Extrusion section. The four-page composition is considered a useable tool for the extrusion coating industry to employ in its present form. The development and performance of this test has increased the reliability of test results from plus or minus 400 per cent to plus or minus 15 per cent.

USDA Reports

FOREST PRODUCTS LABORATORY, Madison Wis., has published Laboratory Report No. 2209, on Method of Determining Specific Gravity of Small Wood Chips. This is a detailed laboratory modification of a present standard method for determining the specific gravity of fine wood particles.

LAKE STATES Forest Experiment Station, University of Minnesota, St. Paul, Minn., has published Station Paper No. 39, Supplement No. 1, on Publications of the Lake States Forest Experiment Station 1956-1960. The publications listed in this report consitute all the material published by the staff during 1956 to 1960. Material published prior to 1956 is listed in Station Paper 39.

SULFATE PULPING OF BALSAM FIR, Laboratory Report No. 2225, has been published by Forest Products Laboratory, Forest Service, Madison, Wis. The report points out that this northern softwood has long been considered for use in sulfate pulping, but it has not been used extensively for such pulping because of its low density, limited availability and relatively high cost. Laboratory studies were therefore undertaken to obtain additional data on the sulfate pulping of this wood.

SOUTHERN PULPWOOD PRODUCTION, 1960, is being made available by the Southeastern Forest Experiment Station, Asheville, N.C., and Southern Forest Experiment Station, New Orleans, La. Tables of pulpwood production in all southern states are given.

REPORT 2207, Pulping and Papermaking Experiments on Certain Philippine Woods and Plant Fibers, is now available from the U. S. Forest Products Laboratory, Madison, Wis. This tells of five hardwoods and several plant fibers from the Philippines which were found suitable to produce various kinds of paper, including wrapping paper, corrugated container board and newsprint paper.

Manufacturers' Publications

Copies of these publications are available at no obligation through our Reader's Service Department. Use the reply card which accompanies this issue when requesting items.

Corrosion-resistant tanks, hoods, ducts

Corite-Reynolds Corp. is offering a new booklet covering corrosion-resistant products of reinforced plastics having special application to the paper industry. The eight-page booklet illustrates and describes the wide variety of tanks, ducts, hoods, scrubbers and fans produced by Corite-Reynolds for applications requiring corrosion resistance. Chemical resistance and physical property tables are also included.

Circle No. 23 on Readers' Service Card

Pulp and paper cleaning unit

Bird Machine Co. has just issued an 8-page illustrated booklet describing their stainless steel, free vortex, drop-in-pressure Cyclean units for removal of dirt and shives from pulp and paper stocks. It also contains size, operational and performance information.

Circle No. 24 on Readers' Service Card

Boiler feedwater treatment

Nalco Chemical Co. offers a 24-page booklet in question and answer form that provides information on boiler feedwater treatment.

Answers are given to questions such as: What causes boiler deposits?; How pure must feedwater be?; and What is meant by external and internal feedwater treatment? The back pages contain an appendix giving important data used in water chemistry and also a useful conversion table.

Circle No. 25 on Readers' Service Card

Spray nozzle

Spraying Systems Co. has issued a bulletin giving complete information on Auto Jet automatic spray nozzles for hydraulically atomizing sprays at operating pressures up to 600 psi. A typical installation is schematically illustrated and described along with accessory equipment.

Circle No. 26 on Readers' Service Card

Gas infra-red equipment

Fannon Products Division of the Hupp Corp. offers an eight-page, technical bulletin describing application of gas infra-red equipment for pre-heating, moisture removal, paint baking and curing applications in industrial processes.

The basic configuration of the Fannon-Schwank infra-red heater and the theory and application of infra-red energy are discussed. Along with a graphic display of heating conditions, 40 different time and temperature relationships are shown for varied materials including metals, textiles and paper.

Circle No. 27 on Readers' Service Card

Caustic soda chart

The Solvay Process Division of Allied Chemical Corp. is offering a wall chart listing safety precautions in handling anhydrous caustic soda. The red and black chart specifies four measures that should be followed to avoid accidents with caustic soda.

Circle No. 28 on Readers' Service Card

Career booklet for paper industry

The Paper Industry Career Guidance Committee has made available through a second printing, 100,000 copies of "Grow With an Exciting Business". This booklet encourages junior and senior high school students to continue their education by portraying the challenging and rewarding careers awaiting them in the paper industry. A list of companies providing scholarship assistance and the schools which have specialized courses in pulp and paper technology is contained in the booklet. Prices of the new edition have been reduced to 15¢ per copy in quantities up to 500 and 10¢ per copy for quantities over 500.

Circle No. 29 on Readers' Service Card

Ball valves

Hills-McCanna Co. has published a new catalog which provides detailed information on the complete line of manually and pneumatically operated ball valves. Also included are dimensions and weights, materials specifications, typical C_v values, pressure-temperature rating charts, and a complete page of detailed ordering instructions.

Circle No. 30 on Readers' Service Card

Industrial marking machines

Industrial Marketing Equipment Co. Inc. has published a four-page brochure featuring a photographic center spread picturing a variety of equipment for solving marketing, dating and coding problems. It includes a number of flexographic imprinting machines for marking cartons, plastics, etc., case sealer marking attachments, coding devices for packaging machines and many others.

Circle No. 31 on Readers' Service Card

Chlorine analyzer

Fischer & Porter Co. describe the F&P Anachlor Residual Chlorine Analyzer, a continuous amperometric analyzer for water supplies and sewage effluents, in their new six-page catalog. Illustrations describe the analyzer unit and the F&P null balance potentiometer that form the complete Anachlor equipment. Comprehensive engineering data and specifications are included in the folder and operation of the equipment is outlined in detail.

Circle No. 32 on Readers' Service Card

Pressure-sensitive tapes

Johns-Manville Dutch Brand Division is offering a two-color, four-page booklet pertaining to selection of pressure-sensitive tape. It describes the types of tapes available, how they are constructed, and the factors involved in choosing a particular tape for a specific application.

Circle No. 33 on Readers' Service Card

Strapping machines

Acme Steel Co. presents a new folder in which they describe the push-button efficiency in unitizing skids of KD corrugated boxes on its models F11D and F11B compression strapping machines. For high-tennage container plants the folder details the automatic conveying, compressing and strapping operaton of the F11D machine. For lower volume operations, it describes the semi-automatic compression strapping operation of the Model F11B.

Circle No. 34 on Readers' Service Card

Portable belt fastener

Scandura Inc. has published a bulletin describing the new Hayden Zipper portable belt fastener. The brochure discusses the belt fastener's features and includes a detailed list of instructions on its use.

Circle No. 35 on Readers' Service Card

Conveyor belt engineering

Hewitt-Robins presents information on conveyor system engineering resulting from a two-year study of Pennsylvania State University engineers. As a result of a grant provided by Hewitt-Robins, these engineers worked in a co-ordinated program which resulted in conveyor system knowledge that will benefit the industry for years to come. Horsepower requirements for belt conveyors have been a controversial subject among bulk materials handling engineers for the past 50 years, because the many variables had never been measured completely to compose an accurate formula. Complete statistical data and tables for calculating, engineering, and selection of conveyor belting are also included in the new publication.

Circle No. 36 on Readers' Service Card

Pneumatic valve positioner

Conoflow Corp. has issued a data sheet describing the company's improved Model J pneumatic valve positioner. Details of operation and complete specifications and dimensions of the pneumatic valve positioner are included.

Circle No. 37 on Readers' Service Card

Industrial brushing tools

M. W. Jenkins' Sons Inc. offers a 14-page book entitled, Standard Nomenclature for Construction of Industrial Brushing Tools. The book illustrates brush construction for every possible industrial application. Characteristics of power-driven cylinder brushes are clearly illustrated by large cross-section drawings. Methods of setting bristles are also shown and the component parts of each type of brush are shown and identified. The new book represents the first effort to create a system of standards for the brush industry and should greatly facilitate the specification and purchase of brushes.

Circle No. 38 on Readers' Service Card

Tension measuring data

Testing Machines Inc. offers a specification sheet which illustrates and describes three different tension meters for checking tensions in paper, plastic, fabric, wire, cable and cord.

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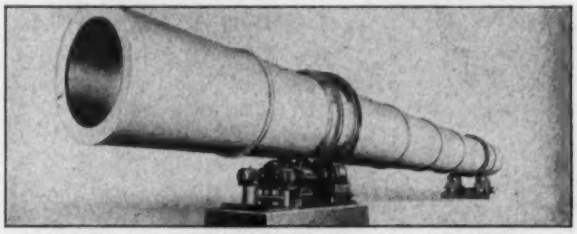

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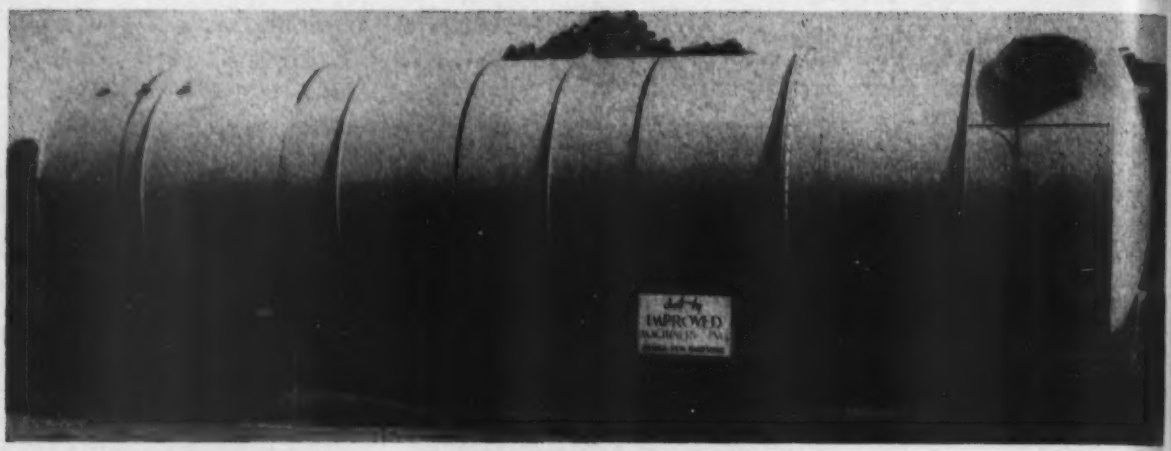
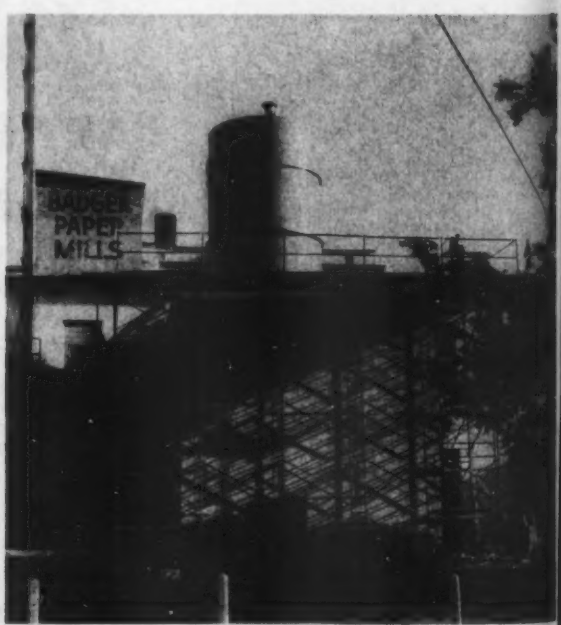


BADGER PAPER MILLS, INC. INSTALLS NEW IMPCO CHLORINATION TOWER

Badger Paper Mills, Inc., Peshtigo, Wisconsin, manufactures fine bleached sulphite papers. They recently installed this chlorination tower which was steel fabricated, rubber-lined, pressure-vulcanized and shipped from Nashua, N. H., in one piece. This tower, 44 feet in length and 11'-6" in diameter is one of many rubber-lined vessels built completely by Impco and lined with Impco compounded rubber. This autoclave vulcanizing method eliminates troubles often experienced with "on location" lining and curing of rubber.



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RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	10.00— 10.50
Soft unbleached muslins	13.50— 14.00
Fancy shirt cuttings	4.00— 5.00
No. 1 percales	4.00— 5.00
No. 1 washables	2.00— 2.25
No. 1 light silesias	6.50— 7.00
Light flannelettes	5.50— 6.00
Cottonades	2.25— 2.50
Blue overall cuttings	5.00— 5.50
Blue cheviots	6.75— 7.25
Canton flannels, bleached	9.00— 10.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	8.50— 9.00
Underwear cuts, bleached	10.50— 11.00
Underwear cuts, unbleached	10.50— 11.00
Sun tan khaki cuttings	5.00— 5.50

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York.

	per cwt.
No. 1 roofing (Chicago)	.65— .70
No. 2 roofing (Chicago)	.55— .60
Twos and blues, repacked	2.00— 2.25
Thirds and blues, repacked	1.50— 1.75

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	85.00— 90.00
No. 1 hard white shavings	70.00— 75.00
No. 1 soft white shavings	45.00— 50.00
Soft white shavings, uncoated	55.00— 60.00
Fly leaf shavings No. 1	17.00— 22.00
Fly leaf, woody, No. 1	17.00— 20.00
Mixed colored shavings	16.00— 18.00
No. 1 books and magazines	13.00— 15.00
Ledger stock, white, No. 1	40.00— 45.00
Ledger stock colored, No. 1 (Midwest ship)	27.50— 30.00
New manila envelope cuttings (free of groundwood)	50.00— 55.00
New manila envelope cuttings (containing groundwood)	40.00— 45.00
Manila tab cards	55.00— 60.00
Colored tab cards	42.50— 45.00
New northern kraft envelope cuttings	50.00— 55.00
Triple sorted kraft, 100%	30.00— 32.50
No. 1 old kraft	22.50—
White news cuts, No. 1	40.00— 45.00
No. 1 overissue news	20.00— 22.00
Folded news, special	16.00— 17.00
Folded news, ordinary	14.00— 15.00
Old corrugated boxes	19.00— 20.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	6.00— 8.00
No. 1 mixed paper	3.00— 10.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.80—
Lump, drums, works, cwt.	5.55—
Powdered, drums, works, cwt.	5.70—
1-Arginine, drums, kilo	60.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.40—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.46—
Imported, 30M Argentine, ex-dock, c. l., lb.	.18¾— .19½
30M N.Z. Lactic, ex-dock, c. l., lb.	.24— .25
China Clay, domestic dry-ground, airfloat, 99% 325-mesh bags, c.l., Georgia works, ton	11.00— 17.00
300-mesh bags, c.l., Georgia works, ton	13.50— 22.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	23.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined (CP, USP) 99% drums c. l., delivered lb.	.26½—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb	.13¼—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	13.00—
N	13.05—
WG	13.15—
WW	13.25—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M.	12.00— 12.25
N	12.35—
WG	12.55—
WW	12.85—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	6.53—
Pearl, 100-lb. bags, cwt.	6.38—
Powdered, 100-lb. paper bags, cwt.	6.58—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb	.12½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.14—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	140.00—
Bleached sulfite, Canadian	140.00—
Unbleached sulfite, Canadian	125.00—
Bleached soda	130.00—135.00
Bleached soda, Canadian	130.00—135.00
Kraft, bleached hardwood	135.00—140.00
Kraft, bleached	145.00—150.00
Kraft, bleached Canadian	150.00—
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, semi-bleached southern	130.00—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	140.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	140.00—
Bleached sulfite, Finnish, freight allowed	140.00—
Unbleached sulfite, Swedish, freight allowed	125.00—130.00
Unbleached sulfite, Finnished, freight allowed	125.00—130.00
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft bleached Swedish, Freight allowed	150.00—155.00
Kraft, bleached, Norwegian	150.00—155.00

PAPER

Quotations are mill quotations Chicago

Book Paper (f.o.b. Chicago, c.l. skids per cwt):	
No. 1 enamels	20.80
No. 2 enamels	19.80
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Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials

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FOREIGN ABSTRACTS

Continued from page 622

to light tall oils. E.g. in determining the acid numbers of low boiling fractions, the presence of phenols prevented sharp end-points in titrations.

In the light oils, the following aromatic compounds were found: guaiacol (0.004 to 0.07 per cent), acetoguaiacone (0.12 to 1.58 per cent), eugenol (0.01 to 0.1 per cent), pinosylvin dimethyl ether (0.3 to 0.72 per cent), isoeugenol methyl ether (0.004 to 0.87 per cent), isoeugenol (0.05 to 0.24 per cent) and pinosylvin monomethyl ether (0.01 to 0.18 per cent). Prior to this, the last 3 components have never been reported in tall oil or its distillates. Another component, which was not found previously, is 5-methyl-2-cyclopentene-2-olone (which was present to the extent of 0.01 to 0.1 per cent).

Apparently the guaiacol-type compounds find their origin in the lignin. Guaiacol itself was found only in 2 light oil samples. The tendency of light oil fractions to darken in alkaline solutions was shown to be proportional to the acetoguaiacone content. When the light oils were redistilled, the contents of isoeugenol, and its methyl ether, as well as acetoguaiacone increased. Pinosylvin monomethyl ether decreased and the dimethyl ether of pinosylvin remained constant. The latter apparently is a component of Scots pine (Pinus sylvestris) in which it was not found previously.

Seventy references. Johan B. Brendenberg. **Soc. Sci Fennica Commentationes Phys. Math. 24, No. 1,** 60 p. (1959) (Original in English).

Size press application of surface sizing agents

The author describes the apparatus and equipment used for treating starches and for preparing kaolin suspension. Only in mills that have a high output, is starch cooked by direct heating; this requires long heating periods, and precautions must be taken against overheating.

Indirect heating of starch suspensions is carried out by the introduction of live steam (at 14.5 to 43.5 lbs per sq. in.) through the base of stainless steel tanks of varying capacities. A suitable propeller (operating at 400 to 500 r.p.m.) provides the required agitation. Water metering is important; and provisions must be made for condensates, temperature, and the position of outlet valves. Modified starches having a reduced viscosity and suitable characteristics are usually bought directly from the manufacturers, instead of being prepared in the paper mill. The dispersion of the starch (in the form of a slurry) is carried out in a chest provided with a turbine. Efficient stirring assures uniformity; air entrapment must be avoided. For such slurries, the power requirements range from 5 to 15 hp per 1000 liters, and these requirements depend on the concentrations of the starch required. Both kaolin and starch slurries are mixed and stirred slowly, even after storage. This avoids sedimentation. Tubs located under size presses should be fitted with regulators that keep the temperature at 50° to 60° C.

Both starch solutions and kaolin dispersions can be pumped. However their mixtures give rise to pulping difficulties. The pumps used should have an output capacity of about five times the amount of material to be taken up by the paper web. Filtration problems, pressure fluctuations in horizontal and vertical size presses, safety devices and cleaning procedures are discussed.

J. Cellier. **Assoc. tech. ind. papetière. Bull. No. 5,** 193-20 (1960) (Original in French, with brief German, English, Spanish and Italian summaries).

CORRECTION

The title "Flocculation of steaming fiber suspensions" which appeared on page 476 in our October issue should have read: "Flocculation of streaming fiber suspensions".

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whither?

in production
processes
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Chemosterilants — a new weapon against insects

USDA scientists have succeeded in completely halting reproduction of several species of insects — such as houseflies, mosquitos, stable flies, screwworms, boll weevils, and Mexican fruit flies — by treating test colonies with minute quantities of sterilizing chemicals. It was found that sterilized females laid no eggs, while the eggs laid by females that mated with sterile males did not hatch.

Most promising among the 60 to 70 sterilants now known are some half a dozen derivatives of ethylenimine — a family of chemicals used in cancer-therapy research. Since these compounds are toxic to warm blooded animals, they must be used under carefully controlled conditions.

Coal slurries can be burned without prior dewatering

A coal slurry containing 30 per cent water was burned during a commercial demonstration at a Jersey Central Power and Light generating station. The successful burning of this slurry indicates the feasibility of general use of pipeline coal slurries which could make this a cheaper source of energy than conventional coal, oil or gas.

The process, developed jointly by Babcock & Wilcox, Consolidation Coal, and Texas Eastern Transmission, requires the use of a B & W cyclone furnace boiler. The coal slurry is pumped through a spray nozzle into the cyclone furnace as a hollow conical spray. Primary air blown into the furnace at 600° F vaporizes the water from the coal particles. Secondary air blown into the furnace at a velocity of over 200 mph sets up centrifugal forces which throw the burning coal particles against the outer walls of the furnace where they are completely burned. Flame temperatures of over 3000° F have been measured by this method of combustion.

The building of a 20- to 30-in. pipeline is now under consideration. This pipeline will carry coal slurries from West Virginia and Western Pennsylvania to the East Coast, with lateral pipelines branching off to supply power plants along the route.

Helicopter logging

The first logging program by helicopter will be put into operation at the Oregon Caves National Monument. A 9-ton capacity Sikorsky flying crane will be used to transport over-ripe timber to the saw mill at an estimated cost of $35.47 per 1000 bd. ft. Depreciation costs on the flying crane will be assumed by the Defense Department.

Increased U. S. exports of paper mill machinery

U. S. exports of paper mill machinery increased from $11.97 million in the first half of 1960 to $14.94 million in the first half of 1961. Among the most notable exports were those to Venezuela, which rose from $127,000 to $3.14 million, and Sweden, which rose from $368,000 to $2.06 million.

Japanese paper demand increasing

Japanese paper demands will rise to 11,740,000 tons by 1970, as was predicted by the Japanese Pulp Federation. This is a 250 per cent increase over the actual 1960 demand. The demand of corrugated cardboard material is expected to rise to 3,390,000 tons which amounts to an increase of 420 per cent over the 1960 demand.

Lightning fixes 1.5 billion tons of atmospheric nitrogen annually

It has been calculated, from quantitative measurements based on electric arc experiments, that lightning results in the annual fixation of 1.5 billion tons of nitrogen which is then washed down by rains and used as plant food. This is one of nature's ways of replenishing the soil with nitrogen which has been going on since the first rain fall on this planet.

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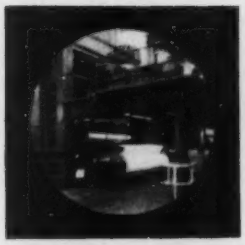
modern Appleton Stack

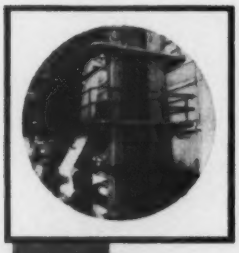
with components to suit specific supercalendering requirements



The Mead Corporation
Chillicothe, Ohio
publication grades

S. D. Warren Company
Muskegon, Michigan
off-machine coated

Nicolet Paper Corporation
West DePere, Wisconsin
glassine



Badger Paper Mills, Inc.
Peshtigo, Wisconsin
waxing stock

Customers have come to know the Appleton approach to building Supercalenders is an art — a fine art that begins with thorough research — culminates in the push-button startup in their mills. In between these first and final steps, go hours of engineering design, machining to pin-point accuracy, expert fabrication, and complete checkout. The result is a solid, integrated stack built to work day-in, day-out at the speed our customer requires. To do this, Appleton provides him with a ruggedly constructed, custom-built unit designed to produce a quality product he can be proud to market.

St. Francisville Paper Company
St. Francisville, Louisiana
machine coated book papers

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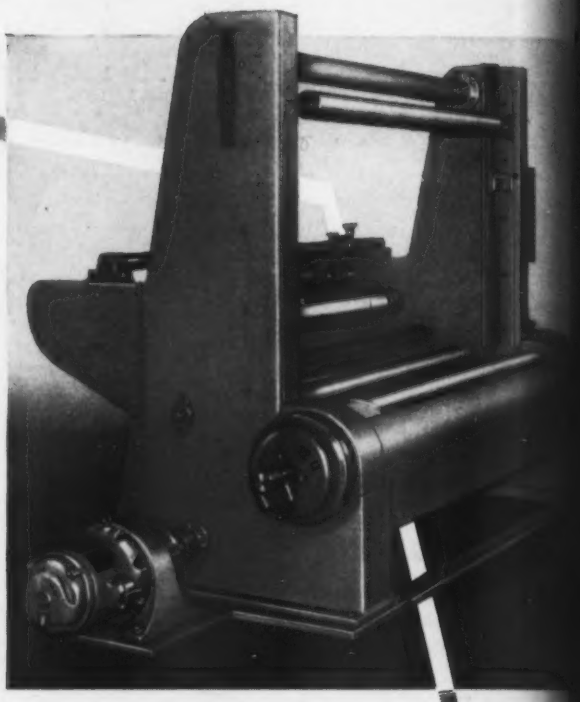
for the paper converting industry



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3. Ease of operation:
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   c. Rider rolls raised and lowered electrica
   with easily adjustable pressure contr
4. Single or dual motor drive furnished for tension control.

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